DOCUMENT RESUME

ED 421 030 HE 031 372

| | |
|---|---|
| AUTHOR | Morris, Libby V. |
| TITLE | Alabama Allied Health Needs Assessment Study. |
| INSTITUTION | Georgia Univ., Athens. Inst. of Higher Education. |
| SPONS AGENCY | Alabama State Commission on Higher Education, Montgomery. |
| PUB DATE | 1997-02-00 |
| NOTE | 96p. |
| PUB TYPE | Reports - Evaluative (142) |
| EDRS PRICE | MF01/PC04 Plus Postage. |
| DESCRIPTORS | *Allied Health Occupations Education; *Allied Health Personnel; Higher Education; *Labor Market; *Labor Supply; *Needs Assessment; Occupational Surveys; Supply and Demand |
| IDENTIFIERS | *Alabama |

ABSTRACT

This study assessed the supply of and demand for allied health professionals in Alabama, focusing on the relationship between supply and demand in various workplace settings in the context of Alabama's demographics, current educational programs, and projected changes in health care. The health care professions included in the study were all fields usually requiring an associate degree: radiography; respiratory therapy; occupational therapy assisting; physical therapy assisting; and medical laboratory technology. The study involved a survey of accredited educational programs in Alabama and analysis of data collected by various Alabama agencies. Following an introduction, the report presents findings for each speciality area in terms of education (program descriptions); the educational programs survey results; workforce demand; and a summary. Major conclusions were, first, that the supply and demand in radiography, respiratory therapy, and medical laboratory technology are in reasonable balance; and, second, that the supply in occupational and physical therapy assisting does not meet demand, especially in South Alabama. Thirty-five tables detail the study's findings. Appendices list individuals involved in the study and demographic data by county. (Contains 36 references and 35 tables.) (DB)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

HE

ED 421 030

# ALABAMA ALLIED HEALTH NEEDS ASSESSMENT STUDY

by
Libby V. Morris, Ph.D.
The University of Georgia
Institute of Higher Education
Athens, GA 30602-1772

HE 031 372

Prepared for Alabama Commission on Higher Education
100 North Union Street, Montgomery, AL 36130-2000
February 1997

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Alabama Commission on Higher Education

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

## TABLE OF CONTENTS


| | | |
|---|---|---|
| | Alabama Allied Health Needs Assessment Study | 1 |
| Table 1 | Health Professions Needs Assessment Study | 5 |
| Table 2 | Components of the Alabama Health Professions Needs Assessment Study | 6 |
| Table 3 | Survey of Educational Programs | 7 |
| | Radiography | 8 |
| Map 1 | Radiography/Radiologic Technology Programs | 14 |
| Table 4 | Educational Programs in Radiography | 15 |
| Table 5 | Radiographers, Alabama | 16 |
| Table 6 | Radiography, Hospital Graduations | 18 |
| Table 7 | Radiographers in the Southeast, 1996 | 19 |
| Figure 1 | Radiographers per 100,000 Population | 19 |
| Table 8 | Alabama Hospital Staffing Trends, 1978-1995, Radiographers | 20 |
| | Medical Laboratory Technicians | 21 |
| Map 2 | Medical Technology and Medical Laboratory Technician Programs | 28 |
| Table 9 | Educational Programs in Medical Laboratory Technology | 29 |
| Table 10 | Medical Laboratory Technician, Alabama | 30 |
| Table 11 | Medical Technologists and Medical Laboratory Technicians in the Southeast, 1996 | 32 |
| Figure 2 | Medical Technologists and Medical Laboratory Technicians per 100,000 Population | 32 |
| Table 12 | Alabama Hospital Staffing Trends, 1978-1995, Medical Laboratory Technician | 33 |
| | Respiratory Care Personnel | 34 |
| Map 3 | Respiratory Therapist Programs | 39 |
| Table 13 | Respiratory Therapy Technician, Alabama | 40 |
| Table 14 | Educational Programs in Respiratory Therapy | 42 |
| Table 15 | Respiratory Therapy Personnel in the Southeast, 1996 | 43 |
| Figure 3 | Respiratory Therapists per 100,000 Population | 43 |
| Table 16 | Alabama Hospital Staffing Trends, 1978-1995, Respiratory Therapy | 44 |
| | Occupational Therapy Assistants | 45 |
| Map 4 | Occupational Therapy and Occupational Therapy Assistant Programs | 49 |
| Table 17 | Educational Programs in Occupational Therapy Assisting | 50 |
| Table 18 | Occupational Therapy Assistants, Alabama | 50 |
| Table 19 | OTR and COTA Personnel in the Southeast, 1996 | 51 |
| Figure 4 | COTA per 100,000 Population | 51 |
| Table 20 | Occupational Therapy Assistants, 1996, Distribution, All Counties | 52 |
| Table 21 | Occupational Therapy Assistants, 1996, Distribution, North and South Alabama | 53 |
| Table 22 | Occupational Therapy Assistants, 1996, North and South Alabama, Descending Order | 54 |
| Table 23 | Occupational Therapy Assistants, 1996, Numbers by County, Descending Order | 55 |
| Table 24 | Alabama Occupational Therapy Assistants, Workforce Distribution by Sector | 56 |
| Table 25 | Alabama Hospital Staffing Trends, 1978-1995, Occupational Therapy Assistants | 57 |
| Table 26 | Alabama Nursing Home Staffing Trends, 1989-1995, Occupational Therapy Assistants | 58 |

*Table of Contents, cont.*


| | | |
|---|---|---|
| | Physical Therapist Assistants | 59 |
| Map 5 | Physical Therapy and Physical Therapist Assistant Programs | 64 |
| Table 27 | Educational Programs in Physical Therapist Assisting | 65 |
| Table 28 | Physical Therapist Assistants, Alabama | 66 |
| Table 29 | Physical Therapist Assistants, Practitioner to Population Ratios, 1996 | 68 |
| Figure 4 | Physical Therapist Assistants per 100,000 Population | 68 |
| Table 30 | Physical Therapist Assistants, 1996, Distribution, All Counties | 69 |
| Table 31 | Physical Therapist Assistants, 1996, Distribution, North and South Alabama | 70 |
| Table 32 | Physical Therapist Assistants, 1996, North and South Alabama, Descending Order | 71 |
| Table 33 | Alabama Hospital Staffing Trends, 1978-1995, Physical Therapist Assistants | 72 |
| Table 34 | Alabama Nursing Home Staffing Trends, 1989-1995, Physical Therapist Assistants | 73 |
| Table 35 | Alabama Home Health Agency Staffing Trends, 1989-1995, Physical Therapist Assistants | 74 |
| | Conclusions and Implications | 75 |
| | References | 80 |
| | Appendix A | 83 |
| | Appendix B | 86 |
| | Appendix C | 91 |
| | Appendix D | 92 |

# ALABAMA ALLIED HEALTH NEEDS ASSESSMENT STUDY

## PURPOSE OF THE STUDY

The purpose of this study was to assess the supply of and demand for allied health professionals in the State of Alabama. This research focused on the relationship between supply and demand in various workplace settings and in the context of Alabama's demographics, current educational programs, and projected changes in health care.

The study population includes the health care professions of radiography, respiratory therapy, occupational therapy assisting, physical therapist assisting, and medical laboratory technology. Professionals in these fields generally graduate from associate degree programs; thus, the accredited programs in these fields in Alabama are included in this study.

An advisory committee made up of representatives from two and four-year colleges in Alabama and representatives of the state's major health care associations and agencies was instrumental to this study (Appendix A). The committee was a valuable resource for guiding, while not directing, the study. And, individually, the members were responsive when called on for assistance. Generous and helpful staff support was provided by the Alabama Commission on Higher Education and the Alabama Department of Postsecondary Education.

In May 1996, the advisory committee met to discuss the parameters of the study and to establish the objectives for the research. In September 1996, an interim report was made to the advisory committee and a time-table for the completion of the study was finalized. A preliminary report was presented to the Alabama Commission on Higher Education in December 1996. Reviewed were the purpose of the study, the objectives, the fields of focus, and the methodology. In February 1997, the advisory committee met in Montgomery at the Alabama Commission on Higher Education, reviewed the allied health sections that follow, and accepted the conclusions of the study.

## RESEARCH QUESTIONS

The research questions guiding this study are as follows:

What is the current supply in a specified field?
How many professionals are active in the workforce?
What is the current and projected supply from accredited educational programs?
How has educational supply changed over time?
What is the current workforce demand in traditional settings?

What is the estimated demand in emerging health care settings?
What are the contextual factors affecting supply and demand?
Are supply and demand currently in balance?
Will future supply and demand likely be in balance?

In essence, the above questions seek to determine if there is an oversupply, an undersupply, or near balance in the aforementioned allied health fields in the State of Alabama. The research questions are placed in the context of the demographic, educational, and geographic factors affecting supply and demand for health care professions in Alabama, across the southeast, and nationally.

## Research Design

The supply of and demand for health professionals may be studied at various levels, using a variety of models. All health professions needs assessment designs consider the *requirements for personnel* and the *supply of personnel*. This study combined a basic and intermediate level analysis to collect and analyze data from established data bases, interviews, and limited surveying. Advanced models and analyses require more extensive data bases and more intensive data collection. Advanced studies are often limited to small area studies (e.g., zip code areas, inner cities) or to identify needs for specific populations (e.g., AIDS, STDs,).

The research model used for the Alabama needs assessment study is shown in Table 1. The model depicts the two major dimensions of analysis: professional supply and workforce demand. It should be noted that this study did not attempt to solve the longstanding problem in health professions research between the variables of "demand" and "need." It is generally assumed that the need for health services in a population may be greater than the expressed demand due to financial constraints and other issues of access.

The model in Table 1 calls for professional supply to be estimated using licensure data, registration/certification data, professional association data, trends in state and substate supply, educational productivity, and national trends. The analysis of workforce demand is established using employment statistics, practitioner-to-population ratios, historical trends, standards and norms, and indirect measures (e.g. recruitment, contract services). The context variables include population data, educational program data, and state and agency regulations.

The study commenced in May 1996 and was completed in February 1997. The specific resources and informational sources used in this study are listed in Table 2, Components of the

Alabama Health Professions Needs Assessment Study. The usefulness of the data sources varied by field. For example, only two of the five allied health professions included in this study are licensed in Alabama: physical therapist assisting and occupational therapy assisting. Radiography, respiratory therapy, and medical laboratory professionals are not subject to licensure in Alabama. Thus, several other professional and employment data bases were employed in this research.

The Alabama State Health Planning and Development Agency provided workforce data describing staffing trends in hospitals, nursing homes, and home health care agencies. One of the most dramatic changes in health care staffing during the previous decade was the increase in contract employment. This trend is most evident in the longitudinal data provided by the home health care sector. Unfortunately, very little is known about the utilization of contract services across the state.

Educational data were provided by the Alabama Commission on Higher Education and the surveys of educational programs. It is important to note that the educational tables herein were created from merging IPEDS data and educational program data. Because numerous institutions were involved in allied health education during the years of the University of Alabama-Birmingham linkage program, the IPEDS data--based on institutional self-reports--tends to over count the number of annual graduates. An over count on graduation data would suggest a larger source of new supply than is actually available. Thus, various sources of educational data were merged with the goal of eliminating duplications and avoiding large over counts in the compilation of graduates by year. *The educational tables, therefore, should be used as a guide to the numbers graduated statewide in a single year and not as an exact count for an institution.* The trend data are considered accurate within the limitations of the above stipulations.

A second major component of the research design was the collection of data by survey. Survey questionnaires were developed to enhance and build on the information available from the existing data bases. For example, directors of all of the existing programs in the fields under study in the state were surveyed to gather their professional judgement on issues of supply and demand, placement of current graduates, applicant to enrollment ratios, anticipated changes, and other issues of importance. Associate degree programs are the primary point of entry into the workforce for these professionals; thus, all associate degree programs either accredited or seeking accreditation in the five fields were surveyed. Because practitioners from both baccalaureate and associate degree programs in radiography and respiratory therapy may enter

the workforce through identical employment positions, baccalaureate programs were surveyed for these two professional fields. Table 3 shows the response rates for the surveys of educational programs.

A second survey was designed for reference laboratories in the state of Alabama. Reference laboratories are licensed by the state and are a major employer of laboratory professionals. This survey was designed and developed with input from Alabama Department of Public Health, Division of Licensure and Certification. A third survey was distributed to professionals who work in professional recruitment for hospitals statewide. This survey produced a small return rate; consequently, this survey was more limited in its usefulness.

A third method of data collection was personal interview. A total of 41 semi-structured interviews ranging from one to two hours in length were completed either on-site or by telephone. Many of the participants were contacted more than once for additional information as new data emerged and questions arose. Included in the interviews were a wide range of practitioners, professional societies, contract agencies, home health care providers, public health personnel, and educational institutions. The list of those interviewed is included as Appendix B. Over 100 additional telephone calls were made to gather specific statistics, facts, and information.

## Interpretation and Analysis

Records, data, and information held by various institutions and agencies across the state were readily made available during the research process. Quantitative and qualitative data were collected and used to develop vacancy rates, population-to-practitioner ratios, geographical distribution scenarios, estimates of supply and demand, and regional comparisons.

The reader should remember that this study was limited by the following factors. The State of Alabama does not maintain a health professions data base. And, licensure for practice is only required in two of the fields under study: physical therapist assisting and occupational therapy assisting. Consequently, less is known about the workforce in the unlicensed fields, e.g., distribution, employment settings. The absence or incompleteness of data bases is not unique to Alabama, but the absence of a practitioner profile limits educational and workforce planning.

Additionally, when using licensure data, it should be remembered that licensure data represent a point in time, and professionals may move during a licensure period, may provide services in more than one county, and may retire or cease to practice while holding a license.

Thus, *the tables showing licensed personnel by county are intended as general descriptors of regional distributions of professionals.* The tables are not intended as a description of counties that do not have services. Contract services and home health care agencies send practitioners into many counties to provide services; thus, a county may not show a professional, but may have professional services.

Although counties and geographic areas may be combined in a variety of ways for analysis, this study used the following standard methods: the state as a whole, individual counties, and north-south aggregations. The northern area of the state is defined as all of those counties existing above a line running between Chambers and Randolph in the East, Bibb and Jefferson in the center, and Sumter and Pickens in the West. Population by county and by north/south division are included as Appendix C and D.

Ideal practitioner-to-population ratios for allied health professionals have not been established; therefore, the ratios established for Alabama could not be judged against an ideal standard. If the nation or surrounding states, however, are used as norms, the supply vis-a-vis the population in Alabama may be used for comparative purposes. Similarly, economic and health status variables may influence the demand for health care and health care professionals. These variables, however, are beyond the scope of this study.

Other considerations specific to the allied health fields in this study are included in the various sections. The reader is referred to specific sections for an explanation of the research findings by field, the discussion, and the conclusions. The conclusions are summarized in the final section along with an overview of related issues that emerged during the course of the study.

---

**TABLE 1**

**Health Professions Needs Assessment Model**

**Professional Supply**
- Licensure Data
- Registration/Certification Data
- State and National Trends
- Substate Trends
- Professional Association Data
- Educational Productivity

**Workforce Demand**
- Practitioner to Population Ratios
- Employment Statistics
- Historical Trends
- Standards and Norms
- Indirect Measures (Recruitment, Contracts)

**Context Variables**
- Population Data
- Geographical & Educational Access
- Emerging Technology
- State and Agency Regulations

## TABLE 2

### Components of the Alabama Health Professions Needs Assessment Study

*Employment Data Bases*

State Health Planning and Development Agency
- Alabama Hospitals (1978-1995)
- Nursing Homes (1989-1995)
- Home Health Care (1989-1995)

Alabama Department of Industrial Relations, Research and Statistics Division

*Professional Supply Data Bases*

Alabama State Board of Occupational Therapy
Alabama State Board of Physical Therapy
Alabama Commission on Higher Education, 1985-1996 IPEDS data
National Professional Certification Boards (see related field)
National Professional Associations (see related field)
State Licensure Boards (GA, MS, TN, SC, NC)

*Surveys*

Accredited Educational Programs in Alabama
- Medical Laboratory Technology Programs
- Occupational Therapy Assisting Programs
- Physical Therapist Assisting Programs
- Radiography Programs
- Respiratory Therapy Programs

Alabama Reference Laboratories (sample)
Hospital Recruiters

*Interviews*

Alabama Universities/Colleges (n=19)
Alabama Hospitals (n=4)
Alabama Nursing Homes (n=1)
State of Alabama Health-Related Offices (n=5)
Alabama Home Health Care (n=7)
Professional Contract Services (n=3)
Alabama Professional Societies (n=2)

TABLE 3

Survey of Educational Programs

| Program | Respondents | Non-Respondents | Total |
|---|---|---|---|
| Medical Laboratory Technicians | 5 | 0 | 5 |
| Physical Therapist Assistants | 4 | 0 | 4 |
| Occupational Therapy Assistants | 2 | 0 | 2 |
| Radiographers * | 9 | 2 | 11 |
| Respiratory Therapists * | 5 | 0 | 5 |
| **Total** | 25 | 2 | 27 |
| **Percentage of Total** | 92.6% | 7.4% | 100.0% |

* Includes programs at all levels.

## RADIOGRAPHY

Radiologic health professionals, also called radiographers and (formerly) x-ray technicians, provide patient services using imaging equipment, as part of the health care team directed by physicians and others who perform radiologic procedures. Radiographers are responsible for producing and processing radiographs that permit accurate interpretation of the human anatomy on x-ray film and/or computer display monitors. These professionals apply knowledge of anatomy, physiology, positioning, and radiographic technique in performance of their responsibilities (Allied Health Education Directory, 1996).

### EDUCATION

Radiologic technology educational programs are accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT), and graduates are credentialed through a national certification examination administered by the American Registry of Radiologic Technologists (ARRT). Radiographers may also complete additional education and become credentialed in six specialty areas recognized by the ARRT: nuclear medicine technology, radiation therapy technology, mammography, magnetic resonance imaging, cardiovascular-interventional technology, and computed tomography.

Radiography programs typically are two years in length, and graduates may earn associate degrees, baccalaureate degrees, certificates, or diplomas, depending on program type. Across the United States, 677 programs are accredited; of that number, approximately one-half are located in hospitals and 44 percent in colleges and universities (JRCERT, 1996). In this decade, enrollments increased dramatically, growing from 18,693 in 1990 to 23,785 in 1994 (JRCERT, 1996). Concomitantly, the number of first-time ARRT examinees grew from 7,241 in 1990 to 10,330 in 1995 (ARRT, 1996).

Eleven programs of radiologic technology are offered in Alabama, and these programs are accredited by the Joint Review Commission on Education in Radiologic Technology (JRCERT, 1996). Radiologic technology programs are well-distributed across the state and are offered in a variety of settings (Map 1). Two programs are located in universities, five in community colleges, and four are hospital-based (Table 4). Because the supply of radiographers may be increased through many types of educational programs, all accredited programs in Alabama are included in this assessment of the supply and demand for radiographers in the state of Alabama.

## Educational Programs Survey

A survey of the directors of the eleven accredited educational programs in Alabama produced valuable information on program productivity, projected changes in programs, workforce supply and demand, and other issues affecting this profession. Nine program directors responded to the survey. As shown in Table 4, total student capacity in the 11 programs numbers 452; however, first-year enrollment across all programs averages approximately 275. Nationally, capacity exceeds the average enrollment, and few programs admit the capacity due to concerns of placing graduates and maintaining quality in the educational experience.

The program directors report that they do not plan to alter the size of their entering classes; however, one respondent noted that they would decrease the program size by 5-8 students, due to a "notable decline in employment opportunities . . ." Another noted the "current oversupply of radiographers" as a factor in the decision to keep program levels low (stated by a small program). Several directors noted a need to be responsive to the market and not saturate a region with graduates making it difficult for graduates of all programs.

Six of the nine respondents noted a decrease in applications. Two program directors said that applications have remained the same. Only one respondent noted an increase in applications. When applicant-to-enrollment ratios drop too low, programs may become less selective and move deeper (and often lower) into an applicant pool to enroll a full class. Less academically able students may pose problems in retention and instruction, and ultimately may have more difficulty in passing certification examinations.

Reflecting the national trend, the number of graduates from the state's 11 programs grew dramatically between 1986 and 1995. In 1985-86, 50 students graduated statewide from the college-based programs (Table 5). During this time period, four programs accounted for the majority of graduates: University of Alabama-Birmingham, University of South Alabama, Jefferson State Community College and Gadsden State Community College. In 1991-92, Wallace State Community College-Dothan graduated its first class of radiologic technologists. The Southern Union program originated as a hospital program that later moved to a technical college (Opelika State), before becoming part of Southern Union Community College.

Beginning in 1991, the number of graduates from all college-based programs never dropped below 100, and in 1994 a high of 195 graduates was reached. In 1996, the total declined

slightly dropping to 182 (Table 5). The Alabama hospital-based programs annually add 20+ graduates, pushing the total number of graduates annually from all programs to 200 (Table 6).

Although all graduates do not pass the certification examination on the first try, the majority become ARRT-certified and join the state's workforce after graduation. Based on steady enrollments and no significant changes in class sizes, an estimated 200 graduates will be added to the state's workforce on an annual basis.

### Professional Supply

Nationally, the Bureau of Labor Statistics (1995) estimates radiologic technologists and technicians employment at 167,000 (1994). As of March 1995, the American Registry of Radiologic Technologists (1996) had issued a total of 267,513 certificates covering seven specialty areas to 215,818 technologists. A total of 203,163 certificates were issued in the largest certification area, radiography. Based on ARRT registration data, there are 77 radiographers per 100,000 population nationwide (Table 7) (ARRT, 1996).

Based on ARRT data, in Alabama, 3,423 practitioners are registered as radiographers, yielding 80.5 per 100,000 population (Table 7). This rate is slightly higher than the national rate of 77.3 per 100,000 and is somewhat higher than the rate in Georgia, Mississippi, and South Carolina (Figure 1). In the Southeast, only North Carolina and Tennessee have slightly more radiographers per population. According to Mark Raymond, Director of Psychometric Services, ARRT, the supply and demand of radiographers nationwide are considered to be in balance (ARRT, Mark Raymond, 1996). The ARRT registration data would also suggest that the supply in Alabama is adequate for demand.

The educational program directors were asked, based on their professional judgment, to characterize the supply in their region and in the state. When asked about the supply of radiographers in their geographical region, five characterized their region's supply as "adequate" and four considered their region as a "slight oversupply." The statewide estimation of supply was similar: three reported an "adequate supply," and six reported a "small oversupply" in Alabama. The term "oversupply" was most often used when characterizing North Alabama.

## Workforce Demand

Hospitals are the predominate workplace setting for radiographers. An estimated 70 percent nationwide work in hospitals; consequently, hospital vacancy rates are a useful way to examine workforce demand. In 1995, according to data collected by the Alabama State Health Planning and Development Agency, a total of 1,477 radiographers were employed full-time in Alabama hospitals, and 314 were employed part-time. A total of 71 vacancies were reported (4.2% vacancy rate). Only in 3 of 18 years has the number of vacancies in the hospital setting exceeded 70. Since 1990, the vacancy rate for radiographers across Alabama's hospital sector has remained below 5 percent (Table 8). In 1995, the hospital vacancy rate in the neighboring state of Georgia declined to 2 percent, reflecting the strong regional supply relative to demand (Morris and Little, 1996).

The validity of the Alabama hospital data was confirmed by the program directors. In the program survey, the program directors were asked to characterize the current employment opportunities for graduates in their geographic region and in the state as the whole. Of the nine respondents, four directors said that "graduates and employment opportunities were approximately balanced," while five directors said "employment opportunities for graduates are currently very limited." Discussions with recruiters for hospitals confirmed that a steady supply of radiographers are needed to meet demand due to retirements and workforce attrition, but the current supply of radiographers was adequate for demand.

Employment opportunities were generally described as more limited in the northern part of the state, while more recently opened programs reported "more opportunities" or better "balance in supply and demand" in their regions. In explaining the supply and demand issue, downsizing of hospitals was noted as a contributing factor to suppressing demand. It was also reported that due to the current tight job market in some areas, graduates might have to take part-time employment or positions without benefits, at least initially.

The Alabama Department of Industrial Relations reports that radiologic technologists and technicians numbered approximately 3,200 in 1994 and are expected to increase to 4,480 in employment by 2005; average annual job openings are estimated at 155 (ADIR, 1996). Forty openings will result from separations, while 115 will be added due to growth. The 200+ graduates from Alabama's current programs meets and exceeds this estimate of demand.

## SUMMARY

Programs of radiologic technology have a long tradition and are among the oldest in allied health. Three of the programs in Alabama's community college sector have been in existence for over 20 years; thus, it is not surprising that supply and demand are in balance. Currently, Alabama's educational programs add 200+ graduates on an annual basis to meet an estimated 155 annual job openings. The rate of practitioners per population in this field is slightly higher in Alabama than nationally, and the vacancy rate in the Alabama's hospital sector is below 5 percent. It is clear that the current number of educational programs across Alabama and the number of graduates annually are sufficient to meet the demand for radiographers; thus, new programs are not needed in radiography.

The community college sector plays an important role in radiographic technology education in Alabama, and the five community college programs enroll approximately 200 students annually in first-year classes. Wallace State Community College in Hanceville is by far the largest of the 11 programs, reporting 65 as the average enrollment number. The Alabama hospital programs are much smaller in number. Many hospital programs have 10 or fewer students. Across the nation, the typical pattern of organization is well-distributed programs accepting 25 or fewer students. It is unusual for programs in radiography to have capacities larger than 50 and highly unusual for program capacity to exceed 75.

The balance between supply and demand which is now evident across Alabama should be carefully monitored. A substantial oversupply might jeopardize existing programs by creating a decline in employment opportunities for new graduates which in turn affects applications and enrollments. Oversupply also tends to affect the quality of applicants as better students turn to other fields where the employment demand is still high, and less able students turn to programs with less competitive applicant pools.

Several themes emerged from the broad-based interviews and from responses of the program directors. Overall, the program directors and clinical directors were concerned about the downsizing in hospitals and managed care and the implications for employment. The general consensus held that an oversupply would emerge unless current enrollments were reduced. Many of the participants called for more emphasis on outcomes assessment. Several who worked in the field noted that the inattention to outcomes had resulted in "flooding the market with poorly trained graduates."

The quality of graduates (from some programs) was questioned by many study participants, not the least of whom were program directors. They noted the need to focus the curriculum on emerging educational needs and improving student outcomes. Program directors described the need to modify the curriculum to provide students with training in the new modalities and technology, but several noted that the curriculum is already full and finding a place "to add more didactic and clinical course work to an already packed curriculum" would be a challenge.

To address the issue of quality, several suggested criteria for clinical sites, tracking the number of graduates who pass the certification examination on the first try, conducting an employer satisfaction survey, and doing graduate interviews. The issue of quality, it should be noted, was raised in other areas of this study, and the report addresses this issue more fully in the conclusions.

The current distribution of radiography programs ensures good geographic access for students from a wide variety of socioeconomic backgrounds, often a challenge for more centralized programs. The current number of programs and their productivity in radiography in Alabama are well-established, and there is no demonstrable need for new programs or increases in enrollment or graduation numbers.

## MAP 1

## RADIOGRAPHY/RADIOLOGIC TECHNOLOGY PROGRAMS*

** Programs shown are accredited by the Joint Review Committee on Education in Radiologic Technology.*

**TABLE 4**
**Educational Programs in Radiography**

| Institutions | Capacity | Slots* |
|---|---|---|
| **Associate Degree Programs** | | |
| *Gadsden State Community College* | 39 | 32 |
| Gadsden | | |
| *George C. Wallace State Community College* | 50 | 25 |
| Dothan | | |
| *George C. Wallace State Community College* | 81 | 65 |
| Hanceville | | |
| *Jefferson State Community College* | 37 | 37 |
| Birmingham | | |
| *Southern Union State Community College* | 30 | 30 |
| Opelika | | |
| **Baccalaureate Programs** | | |
| *University of Alabama at Birmingham* | 81 | 15 |
| Birmingham | | |
| *University of South Alabama* | 83 | 37 |
| Mobile | | |
| **Certificate Programs, Hospital-based** | | |
| *Baptist Medical Center* | 12 | 9 |
| Montgomery | | |
| *Carraway Methodist Medical Center* | 12 | 8 |
| Birmingham | | |
| *DCH Regional Medical Center* | 12 | 9 |
| Tuscaloosa | | |
| *Huntsville Hospital* | 15 | 8 |
| Huntsville | | |
| **Total** | **452** | **275** |

Programs = 11
Approved Capacity = 452

Programs accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT), July 1996

* Average number of slots as reported by survey respondents.

**TABLE 5**
**Radiographers**
**Alabama**

| Year | Institution | Award > 1 Award < 2 | Associate | Award > 2 Award < 3 | Bachelor | Total |
|---|---|---|---|---|---|---|
| 1985-86 | Gadsden State Community College | | 9 | | | |
| | Jefferson State Community College | | 22 | | | |
| | University of Alabama at Birmingham | | | | 11 | |
| | University of South Alabama | 8 | | | | |
| | Total | 8 | 31 | | 11 | 50 |
| 1986-87 | Gadsden State Community College | | 10 | | | |
| | Jefferson State Community College | | 26 | | | |
| | University of Alabama at Birmingham | 46 | | | 4 | |
| | University of South Alabama | | | 10 | | |
| | Total | 46 | 36 | 10 | 4 | 96 |
| 1987-88 | Gadsden State Community College | | 15 | | | |
| | Jefferson State Community College | | 13 | | | |
| | University of Alabama at Birmingham | 22 | | | 1 | |
| | University of South Alabama | | | 13 | | |
| | Total | 22 | 28 | 13 | 1 | 64 |
| 1988-89 | Gadsden State Community College | | 20 | | | |
| | Jefferson State Community College | | 18 | | | |
| | University of Alabama at Birmingham | 23 | | | 2 | |
| | University of South Alabama | | | 13 | | |
| | Total | 23 | 38 | 13 | 2 | 76 |
| 1989-90 | Gadsden State Community College | | 15 | | | |
| | Jefferson State Community College | | 18 | | | |
| | University of Alabama at Birmingham | 26 | | | 1 | |
| | University of South Alabama | | | 17 | | |
| | Total | 26 | 33 | 17 | 1 | 77 |
| 1990-91 | Gadsden State Community College | | 23 | | | |
| | Jefferson State Community College | | 24 | | | |
| | University of Alabama at Birmingham | 25 | | | 7 | |
| | University of South Alabama | | | 19 | | |
| | Total | 25 | 47 | 19 | 7 | 98 |
| 1991-92 | Gadsden State Community College | | 23 | | | |
| | Jefferson State Community College | | 30 | | | |
| | University of Alabama at Birmingham | 31 | | | 6 | |
| | University of South Alabama | | | 21 | | |
| | Wallace State Community College/Dothan | | 16 | | | |
| | Wallace State Community College/Hanceville | | 18 | 10 | | |
| | Total | 31 | 87 | 31 | 6 | 155 |

TABLE 5, cont.
Radiographers

| Year | Institution | Award > 1 Award < 2 | Associate | Award > 2 Award < 3 | Bachelor | Total |
|---|---|---|---|---|---|---|
| 1992-93 | Gadsden Community College | | 28 | | | |
| | Jefferson State Community College | | 27 | | | |
| | University of Alabama at Birmingham | 26 | | | 11 | |
| | University of South Alabama | | | 27 | | |
| | Wallace State Community College/Dothan | | 17 | | | |
| | Wallace State Community College/Hanceville | | 45 | | | |
| | Total | 26 | 117 | 27 | 11 | 181 |
| 1993-94 | Gadsden State Community College | | 27 | | | |
| | Jefferson State Community College | | 46 | | | |
| | Opelika State Tech College | 10 | 1 | | | |
| | University of Alabama at Birmingham | 29 | | | 20 | |
| | University of South Alabama | | | 16 | | |
| | Wallace State Community College/Dothan | | 13 | | | |
| | Wallace State Community College/Hanceville | | 33 | | | |
| | Total | 39 | 120 | 16 | 20 | 195 |
| 1994-95 | Gadsden State Community College | | 29 | | | |
| | Jefferson State Community College | | 28 | | | |
| | University of Alabama at Birmingham | 33 | | | 15 | |
| | University of South Alabama | | | 27 | | |
| | Wallace State Community College/Dothan | | 18 | | | |
| | Wallace State Community College/Hanceville | | 45 | | | |
| | Total | 33 | 120 | 27 | 15 | 195 |
| | Gadsden State Community College | | 26 | | | |
| | Jefferson State Community College | | 30 | | | |
| 1995-96 | Southern Union State Community College | | 29 | | | |
| | University of Alabama at Birmingham | | | | 16 | |
| | University of South Alabama | | | 22 | | |
| | Wallace State Community College/Dothan | | 9 | | | |
| | Wallace State Community College/Hanceville | | 50 | | | |
| | Total | | 144 | 22 | 16 | 182 |
| 1985-96 | Total | 279 | 801 | 195 | 94 | 1,369 |

Source:
1985-1986: HEGIS Degrees and Other Formal Awards Conferred, 1986. Unpublished raw data.
1987-1996: Integrated Postsecondary Education Data System (IPEDS), 1987-1996. Unpublished raw data.
Note: CIP Code = 51.0907, Medical Radiologic Technician

**TABLE 6**
**Radiography**
**Hospital Graduations**

| Year | Hospital | Graduates |
|---|---|---|
| 1990 | Hunstville Hospital | 7 |
| | DCH Regional Medical Center | 5 |
| | Baptist Medical Center | 2 |
| | Total | 14 |
| 1991 | Hunstville Hospital | 7 |
| | DCH Regional Medical Center | 6 |
| | Baptist Medical Center | 6 |
| | Total | 19 |
| 1992 | Hunstville Hospital | 10 |
| | DCH Regional Medical Center | 11 |
| | Baptist Medical Center | 6 |
| | Total | 27 |
| 1993 | Hunstville Hospital | 16 |
| | DCH Regional Medical Center | 7 |
| | Baptist Medical Center | 6 |
| | Total | 29 |
| 1994 | Hunstville Hospital | 7 |
| | DCH Regional Medical Center | 8 |
| | Baptist Medical Center | 8 |
| | Total | 23 |
| 1995 | Hunstville Hospital | 7 |
| | DCH Regional Medical Center | 9 |
| | Baptist Medical Center | 10 |
| | Total | 26 |
| 1996 | Hunstville Hospital | 7 |
| | DCH Regional Medical Center | 9 |
| | Baptist Medical Center | 8 |
| | Total | 24 |
| 1990-1996 | **Total** | **162** |

**TABLE 7**
**Radiographers in the Southeast**
**1996**

| State | 1995 Population | Number* | Rate per 100,000 Population |
|---|---|---|---|
| **Alabama** | 4,253,000 | 3,423 | 80.5 |
| **Georgia** | 7,201,000 | 5,507 | 76.5 |
| **Mississippi** | 2,697,000 | 1,913 | 70.9 |
| **North Carolina** | 7,195,000 | 6,191 | 86.0 |
| **South Carolina** | 3,673,000 | 2,950 | 80.3 |
| **Tennessee** | 5,256,000 | 4,569 | 86.9 |
| **United States** | 262,755,270 | 203,163 | 77.3 |

Source: American Registry of Radiologic Technologists

* Certificates registered as of March 27, 1996.

**FIGURE 1**
**Radiographers per 100,000 Population**

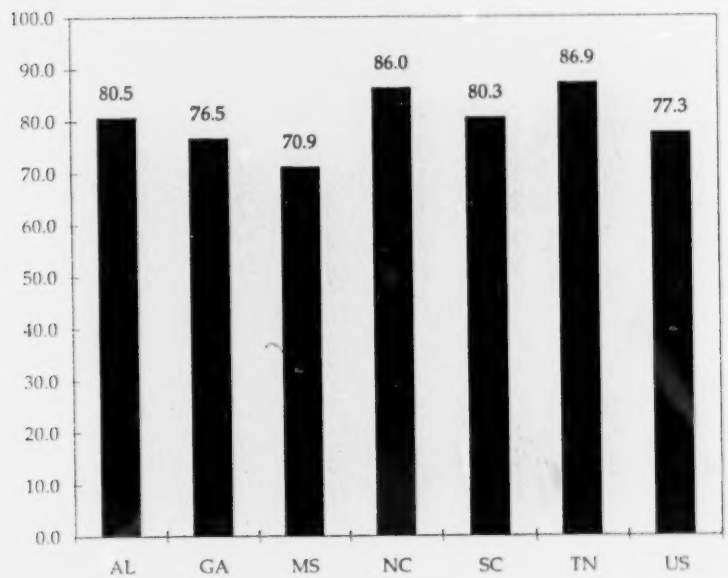

**TABLE 8**
**Alabama Hospital Staffing Trends, 1978-1995**
**Radiographers**

| Year | Full-time | Part-time | Vacancies | FTE | Vacancy Rate % |
|---|---|---|---|---|---|
| 1978 | 876 | 103 | 40 | 967.5 | 4.1% |
| 1979 | 964 | 115 | 44 | 1,065.5 | 4.1% |
| 1980 | 1,010 | 131 | 58 | 1,133.5 | 5.1% |
| 1981 | 1,102 | 135 | 54 | 1,223.5 | 4.4% |
| 1982 | 1,123 | 149 | 47 | 1,244.5 | 3.8% |
| 1983 | 1,106 | 145 | 32 | 1,210.5 | 2.6% |
| 1984 | 1,063 | 146 | 38 | 1,174.0 | 3.2% |
| 1985 | 1,024 | 177 | 30 | 1,142.5 | 2.6% |
| 1986 | 1,099 | 177 | 35 | 1,222.5 | 2.9% |
| 1987 | 1,095 | 189 | 54 | 1,243.5 | 4.3% |
| 1988 | 1,168 | 246 | 52 | 1,343.0 | 3.9% |
| 1989 | 1,196 | 224 | 77 | 1,385.0 | 5.6% |
| 1990 | 1,264 | 272 | 72 | 1,472.0 | 4.9% |
| 1991 | 1,399 | 266 | 47 | 1,579.0 | 3.0% |
| 1992 | 1,473 | 256 | 53 | 1,654.0 | 3.2% |
| 1993 | 1,453 | 295 | 42 | 1,642.5 | 2.6% |
| 1994 | 1,435 | 295 | 38 | 1,620.5 | 2.3% |
| 1995 | 1,477 | 314 | 71 | 1,705.0 | 4.2% |

Source:
State Health Planning and Development Agency, 1994, H-11.
State Health Planning and Development Agency, 1995, H-2.

## MEDICAL LABORATORY TECHNICIANS

Medical laboratory technicians (MLTs) perform general tests in all laboratory areas, including routine sample testing, record keeping, and maintaining equipment. Positions for technicians exist in hospitals, for-profit laboratories, clinics, public health facilities, and business and industry. Technicians work under the supervision of pathologists or medical technologists.

Medical technologists (MTs) perform a variety of laboratory tests which contribute to the diagnosis and treatment of disease. Medical technologists work in five major areas: blood banking, chemistry, hematology, immunology, and microbiology. Medical technologists supervise laboratory technicians, and they may also engage in research and teaching. Other laboratory personnel include histologic technicians and technologists, phlebotomy technicians, blood banking technologists, and cytotechnologists. Medical technologists and other laboratory personnel were not the focus of this study of supply and demand; however, because technicians and technologists overlap in workforce and clinical sites, medical technologists are included in several places in this report.

### EDUCATION

Programs of medical technology are accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). In 1990 there were 256 accredited medical laboratory technology (MLT) programs, of which 215 were associate degree and 41 were certificate programs (CAAHEP, 1994). The number of programs has declined slightly over the past few years, and currently, there are 224 associate degree and 35 certificate MLT programs nationwide. There are five *active* medical laboratory technology programs in Alabama, and all are located in the community college sector (Map 2). Four of the programs have been in existence for more than two decades. A sixth program at Southern Union Community College has program approval from the Alabama Commission on Higher Education, but has not yet been implemented (Table 9).

Medical laboratory technicians complete programs that are two years in length, and a total of 587 students have graduated in this field in Alabama since 1985 (Table 10). The average number of graduates annually has increased dramatically in the last 3 years, averaging 74 from 1993-96. During the previous 8 years, the average number of graduates numbered 45. The majority of degrees were awarded at the associate level.

Four of the five active technician - level programs admit students twice per year. The five have a combined student capacity of 146 first-year slots. Average enrollment annually is slightly over 100 according to the program directors. None of the directors report any planned changes in class size. Only one program noted a decrease in applications and enrollments, and this change was partially credited to students selecting other more recently added health programs at the institution and a decrease in scholarships for study in this area.

Medical technologists complete baccalaureate degree programs that include three years of course work and twelve months of clinical practice. The number of MT programs nationwide has declined from 615 in 1984 to 334 in 1996 (NAACLS, Olive M. Kimball, 1997). A total of eight medical technology programs are located in Alabama: four are university based, and the remainder are in hospitals or other laboratories (Map 2). Currently, the hospital-based program at DCH is inactive. Since 1990, the number of MT graduates annually has averaged just over 40 from all Alabama programs. Map 2 shows that programs in the clinical laboratory field at the certificate, associate, and baccalaureate level are well-distributed across Alabama. Twelve programs currently are active.

### Professional Supply

Alabama does not require licensure for medical laboratory personnel; only the laboratory is licensed. Thus, the actual number of medical laboratory technicians and technologists in Alabama is estimated from other sources. According to the Alabama Department of Industrial Relations, approximately 4,800 people were employed in all clinical laboratory positions in Alabama in 1994, and the total number of annual job openings equaled 125 (80 due to growth and 45 due to separations). Many of the people working in this field, especially at the lower levels, were trained on the job, and they have not completed clinical laboratory education programs. On-the-job training is viewed as a serious problem by professionals in the field.

The American Society of Clinical Pathologists reports that 840 medical technologists and 369 technicians in Alabama hold ASCP certification (ASCP, Juanita Crannel, 1996). Table 11 shows that the rate of technicians with ASCP certification is among the highest in the southeast and at 8.7 per 100,000 population is greater than the national rate of 6.2 per 100,000 population. At 19.8 per 100,000 population, MTs in Alabama are roughly equal to the national rate per

100,000 population and are higher than any surrounding state (Figure 2). The number of technicians and technologists in Alabama holding certification from other professional bodies is unknown.

Hospital and independent laboratories are major places of employment for medical laboratory technicians and technologists. Overall in Alabama, there are an estimated 2,800 independent laboratories that fall under federal, i.e., CLIA, regulations. Independent laboratories might exist in physician offices and other health care clinics. These laboratories are not licensed by the state of Alabama and they may use untrained people to work in "waivered areas," the lowest skill areas of the laboratory as defined by the CLIA regulations. Several respondents, both in interviews and through survey, expressed concern about quality in the laboratories when untrained or on-the-job trained personnel are used extensively, perhaps slipping into areas beyond their expertise. It is interesting that very few medical laboratory technicians or technologists work in the state laboratory system.

About 150 independent laboratories in Alabama are licensed by the state and are classified as "reference laboratories," i.e., laboratories that perform work for other facilities, offices, and so forth. Approximately 50 hospital laboratories also have reference laboratory designation. Reference laboratories must have a medical technologist or a medical laboratory technician in a supervisory position, and these laboratories are subject to the regulations associated with the licensure act. Under CLIA regulations, "moderately complex areas" require MLTs and "complex" areas require MTs or highly trained and experienced MLTs. Because Alabama's reference laboratories are an important employment site for college-educated and certified personnel, a sample survey of reference laboratories was conducted.

## Workforce Demand

*Reference Laboratories.* In addition to examining demand in hospital laboratories, the demand for technologists and technicians was assessed by survey of a representative sample of independent or "reference" laboratories. The Department of Public Health, Licensure and Certification Division, was consulted for assistance in selecting the sample population, and both size and geographical location were used as criteria for sample selection. Thirteen of 20 surveyed laboratories responded, and the respondents represented all regions of the state. At least two of the respondents reported multiple locations across the state. Overall, the survey

respondents (75%) described the supply of medical laboratory technicians statewide as "adequate." Two respondents felt there was a "slight oversupply of MLTs." Only one respondent noted difficulty in finding MLTs when a vacancy occurred.

The laboratory directors noted that rural areas and small hospitals had the most difficulty in meeting their need for personnel. In responding to a question about employment opportunities, over 50 percent of the respondents said that employment opportunities for MLT graduates are "currently very limited." Thirty percent said that "graduates and employment opportunities are approximately balanced." When asked how employment opportunities for technicians might change over the next few years, 70 percent of the respondents projected that demand will "remain the same" or "lessen somewhat." Less than one-third of the respondents thought that demand might "increase slightly."

The assessment provided by the laboratory directors was supported by their employment data. Only four vacancies for MLTs were reported by the respondents (less than 4 percent vacancy rate). Additionally, 9 of the 13 respondents reported that they did not project the addition of any new positions over the next five years. The respondents who felt that positions might be added collectively reported no more than 5 new positions annually.

***Alabama Hospitals.*** In addition to reference laboratories, hospitals are a source for demand data in the clinical laboratory field. Hospital vacancy rates provide a general indication of the demand for laboratory personnel due to the fact that more than one-half of the technicians and technologists in this field work in the hospital setting. A national survey of selected laboratories and hospitals by the American Clinical Pathologists' Board of Registry found vacancy rates for medical laboratory technicians just below 14.8 percent in 1994, up from 6.5 percent in 1988. The study noted that high vacancies are found in the South, especially in those areas with smaller and rural hospitals (Castleberry, 1995), and that fewer and less severe shortages were experienced by communities with nearby training programs in medical laboratory education. Those persons interviewed and surveyed in Alabama confirmed the findings of this study, noting that west Alabama, a region without MT or MLT programs, has the most difficulty attracting trained personnel, and that rural hospitals also had difficulty in employment.

The overall vacancy rate for MLTs in Alabama hospitals averaged 7.5 percent in 1995 (n=114 positions) (State Health Planning and Development Agency, 1995). This percentage and number of vacancies are the highest reported for the time period 1978-1995 (Table 12). Between 1990 and 1994, the hospital vacancy rate for technicians never exceeded 5 percent. Only in 3 of 18 years from 1978 to 1995 did the rate exceed 5 percent. The SHPDA hospital data, showing low to moderate vacancy rates, were confirmed by hospital recruiters who assessed the field as "adequate in supply" with no significant changes expected in the future.

The 1994 Wage and Vacancy Survey of Medical Laboratories (1995) reported that the distribution of clinical laboratory staff was as follows: 22 percent MLT, 58 percent MT staff, 16 percent MT supervisors, and 5 percent MT managers. This workforce distribution is somewhat mirrored in Alabama as evidenced by the data in Table 11 that shows that ASCP-certified technologists outnumber technicians by more than two to one.

### Educational Program Survey

The directors of the state's five MLT programs responded to a survey concerning supply and demand in their geographical areas and statewide. In the survey, the majority of program directors characterized the current supply of medical laboratory technicians as "adequate." One program director sought input from the clinical directors for his program, and this increased the information from clinical sites. The clinical directors expressed concern that the future supply will outweigh demand if downsizing and other cost controls drive decision-making in health care. One noted that "if Alabama does not place restrictions on who can perform testing, then I foresee large companies and facilities using the cheapest labor possible," raising questions of quality.

Overall, the program directors described employment opportunities in their region and state as ranging from "approximately balanced" to a "moderate number of openings for graduates." One director noted that graduates might have to relocate within 60 to 100 miles, and another director noted that the openings were "approximately balanced, but definitely on the low side."

The observations of a somewhat tight job market echo a 1995 study by the ASCP Board of Registry, in which program directors were asked about recruitment, enrollment, graduation, and placement (Castleberry, 1996). Overall, the national percentage of MLT graduates who

obtained employment after graduation slipped from 84 percent in 1994 to 74 percent in 1995. In Region 3 (Tennessee, Mississippi, Georgia, Alabama, and Florida), the percentage gaining employment declined more slowly, going from 87 percent in 1994 to 80 percent in 1995. Ninety percent of the MLT programs nationwide participated in this survey.

Employment of graduates and clinical rotations were among the major concerns voiced by the Alabama program directors. It was noted that recent graduates might have to accept part-time work or per diem while waiting for a full-time position. The effects of cost-containment strategies and downsizing were believed to have an effect on the laboratory field, and it was observed that some hospitals showed a reluctance to provide clinical laboratory rotations, due to excessive workloads or insufficient staff. Others noted that the number of workplace sites might remain the same for their programs, but the number of clinical seats per affiliate might decrease. It should be remembered that both MT and MLT programs are seeking clinical sites in the same hospitals and laboratories, producing a great deal of competition among the 10 non-hospital based programs.

Several Alabama program directors spoke of the need for funds for updating equipment, service contracts, and supplies. Another director cited "inadequate funds for sufficient numbers of full-time instructors in the current junior college-based programs." One respondent summarized the supply and demand scenario as follows: "I see no point in adding additional MLT programs which are expensive to equip and run simply to graduate *additional* students in a field which is adequately supplied. Additional programs will immediately place stress on the job market."

## Summary

Supply and demand appear to be in near balance in the allied health field of medical laboratory technology, and there does not appear to be sufficient justification for the expansion or creation of new programs in the foreseeable future. This assessment is based on information provided by reference laboratories, educational programs, Alabama hospitals, and health care professionals.

Five programs for medical laboratory technology education are offered in Alabama and an additional program is planned. The annual number of MLT graduates in recent years has

climbed to 74, up from an average of 45 throughout the previous 8 years. Alabama has also been effective in bringing the rate of ASCP-MLTs higher than the national average.

A review of the hospital data and reference laboratories shows a steady, constant demand for MLTs, but a field in which supply and demand are in near balance, and as is noted in some cases, slightly oversupplied. As in other health care professions, the greatest difficulty in meeting demand occurs in small hospitals or laboratories in rural areas. Difficulties in satisfying demand in small facilities and rural areas are generally the result of a combination of factors, such as location and employment conditions, as much as the adequacy of overall supply in a state or region. One of those interviewed suggested that rural hospitals need to provide scholarships for current employees to study at the associate degree level as has been done for many years at the baccalaureate level and in other fields, especially in nursing. This could be an effective mechanism to attract graduates to rural areas. Another program director spoke of deliberate attempts to recruit students and to place clinical rotations in rural hospitals to encourage future employment in those locations.

A concern in Alabama is the lack of licensure in this field. The states of Louisiana, Tennessee, and Florida license personnel in the laboratory field, while Georgia regulates practice through hospitals and laboratories being held accountable for the qualifications of their employees. Concern was expressed over the lack of licensure and/or regulation in Alabama and the impact from increasing regulations in adjoining states. One respondent, however, noted that the enforcement of CLIA might serve to differentiate medical laboratory technicians from technologists and from noncertified, expander personnel, allowing MLTs to find their own professional strength in the field.

In considering the future supply in this field, it should be noted that a program at Southern Union Community College is currently under development with approval from the Alabama Commission on Higher Education. This program, in combination with the capacity of the existing programs, will allow the supply in Alabama to continue to grow over the next several years. If demand lessens for MLTs, the current programs will need to consider adjusting enrollments to avoid state or regional oversupply. Thus, it appears that supply and demand for MLTs are in relative balance and the demand for MLTs in the future can be met by the current educational programs.

## MAP 2

## MEDICAL TECHNOLOGY (MT) AND MEDICAL LABORATORY TECHNICIAN (MLT) PROGRAMS *

** Includes recently approved MLT programs at Bevill and Southern Union, as well as programs accredited by the National Accrediting Agency for Clinical Laboratory Sciences.*

**TABLE 9**
**Educational Programs in**
**Medical Laboratory Technology**

| Institution | Capacity |
|---|---|
| *Bevill State Community College** | 40 |
| Sumiton | |
| *Gadsden State Community College* | 34 |
| Etowah | |
| *George C. Wallace State Community College* | 8 |
| Dothan | |
| *George C. Wallace State Community College* | 40 |
| Hanceville | |
| *Jefferson State Community College* | 24 |
| Birmingham | |
| *Southern Union State Community College*** | - - |
| Opelika | |

Source:
ASCP board of Registry, Web Page.
NAACLS and CAAHEP Accredited Programs.
NAACLS, Olive M. Kimball, 2/97.
Alabama Commission on Higher Education
* Applicant Status
** ACHE approved, not yet implemented.

TABLE 10
Medical Laboratory Technician
Alabama

| Year | Institution | Award > 1 Award < 2 | Associate | Bachelor | Total |
|---|---|---|---|---|---|
| 1985-86 | Jefferson State Community College | | 19 | | |
| | University of Alabama at Birmingham | 15 | | | |
| | Wallace State Community College/Dothan | | 9 | | |
| | Wallace State Community College/Hanceville | | 11 | | |
| | Total | 15 | 39 | 0 | 54 |
| 1986-87 | Jefferson State Community College | | 13 | | |
| | University of Alabama at Birmingham | 18 | | | |
| | Wallace State Community College/Dothan | | 9 | | |
| | Wallace State Community College/Hanceville | | 10 | | |
| | Wallace State Community College/Selma | | 1 | | |
| | Total | 18 | 33 | 0 | 51 |
| 1987-88 | Gadsden State Community College | | 5 | | |
| | Jefferson State Community College | | 1 | | |
| | University of Alabama at Birmingham | 4 | | | |
| | Wallace State Community College/Dothan | | 7 | | |
| | Wallace State Community College/Hanceville | | 6 | | |
| | Total | 4 | 19 | 0 | 23 |
| 1988-89 | Gadsden State Community College | | 13 | | |
| | Jefferson State Community College | | 5 | | |
| | University of Alabama at Birmingham | 3 | | | |
| | Wallace State Community College/Dothan | | 7 | | |
| | Wallace State Community College/Hanceville | | 10 | | |
| | Total | 3 | 35 | 0 | 38 |
| 1989-90 | Gadsden State Community College | | 18 | | |
| | Jefferson State Community College | | 6 | | |
| | University of Alabama at Birmingham | 6 | | | |
| | Wallace State Community College/Dothan | | 5 | | |
| | Wallace State Community College/Hanceville | | 11 | | |
| | Total | 6 | 40 | 0 | 46 |
| 1990-91 | Gadsden State Community College | | 17 | | |
| | Jefferson State Community College | | 8 | | |
| | University of Alabama at Birmingham | 5 | | | |
| | Wallace State Community College/Dothan | | 2 | | |
| | Wallace State Community College/Hanceville | | 15 | | |
| | Total | 5 | 42 | 0 | 47 |

TABLE 10, cont.

Medical Laboratory Technician

| Year | Institution | Award > 1 Award < 2 | Associate | Bachelor | Total |
|---|---|---|---|---|---|
| 1991-92 | Gadsden State Community College | | 16 | | |
| | Jefferson State Community College | | 6 | | |
| | Wallace State Community College/Dothan | | 6 | | |
| | Wallace State Community College/Hanceville | | 16 | | |
| | Total | 0 | 44 | 0 | 44 |
| 1992-93 | Gadsden State Community College | | 26 | | |
| | Jefferson State Community College | | 11 | | |
| | University of Alabama at Birmingham | 3 | | | |
| | Wallace State Community College/Dothan | | 5 | | |
| | Wallace State Community College/Hanceville | | 16 | | |
| | Total | 3 | 58 | 0 | 61 |
| 1993-94 | Gadsden State Community College | | 29 | | |
| | Jefferson State Community College | | 17 | | |
| | University of Alabama at Birmingham | 14 | | | |
| | University of West Alabama | | 2 | | |
| | Wallace State Community College/Dothan | | 5 | | |
| | Wallace State Community College/Hanceville | | 14 | | |
| | Total | 14 | 67 | 0 | 81 |
| 1994-95 | Gadsden State Community College | | 22 | | |
| | Jefferson State Community College | | 18 | | |
| | Southern Union State Community College | | 1 | | |
| | University of Alabama at Birmingham | 9 | | | |
| | Wallace State Community College/Dothan | | 5 | | |
| | Wallace State Community College/Hanceville | | 16 | | |
| | Total | 9 | 62 | 0 | 71 |
| 1995-96 | Bevil State Community College | | 10 | | |
| | Gadsden State Community College | | 18 | | |
| | Jefferson State Community College | | 13 | | |
| | Wallace State Community College/Dothan | | 11 | | |
| | Wallace State Community College/Hanceville | | 19 | | |
| | Total | | 71 | | 71 |
| 1985-96 | **Total** | 77 | 510 | 0 | 587 |

Source:

1985-1986: HEGIS Degrees and Other Formal Awards Conferred, 1986. Unpublished raw data.

1987-1996: Integrated Postsecondary Education Data System (IPEDS), 1987-1996. Unpublished raw data.

Note: CIP Code = 51.1004

**TABLE 11**
**Medical Technologists and Medical Laboratory Technicians in the Southeast**
**1996**

| State | 1995 Population | MT (ASCP) | Rate per 100,000 Population | Associate Members | MLT (ASCP) | Rate per 100,000 Population | Associate Members |
|---|---|---|---|---|---|---|---|
| **Alabama** | 4,253,000 | 840 | 19.8 | 522 | 369 | 8.7 | 281 |
| **Georgia** | 7,201,000 | 1,154 | 16.0 | 795 | 381 | 5.3 | 287 |
| **Mississippi** | 2,697,000 | 461 | 17.1 | 358 | 289 | 10.7 | 255 |
| **North Carolina** | 7,195,000 | 1,147 | 15.9 | 901 | 454 | 6.3 | 393 |
| **South Carolina** | 3,673,000 | 443 | 12.1 | 366 | 437 | 11.9 | 311 |
| **Tennessee** | 5,256,000 | 925 | 17.6 | 561 | 437 | 8.3 | 275 |
| **United States** | **262,755,270** | **53,479** | **20.4** | **36,663** | **16,213** | **6.2** | **11,033** |

Source: American Society of Clinical Pathologists, Juanita Crannel, 11/96

**FIGURE 2**
**Medical Technologists and Medical Laboratory Technicians per 100,000 Population**

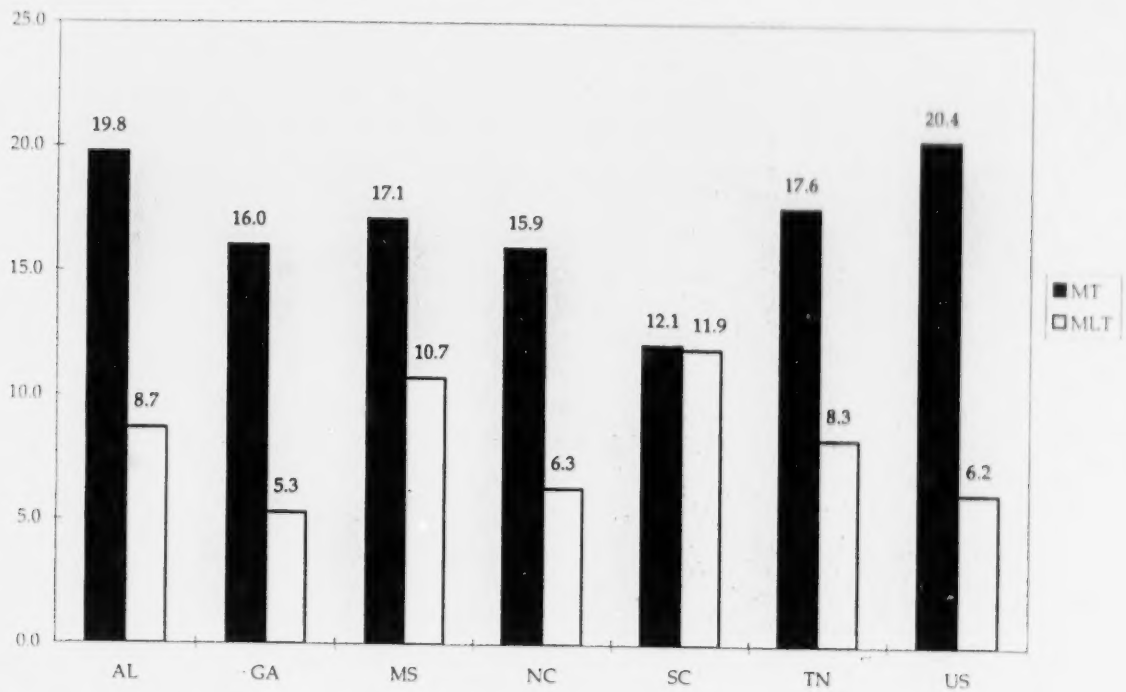

**TABLE 12**

**Alabama Hospital Staffing Trends, 1978-1995**

**Medical Laboratory Technician**

| Year | Full-time | Part-time | Vacancies | FTE | Vacancy Rate % |
|---|---|---|---|---|---|
| **1978** | 1,076 | 281 | 37 | 1,253.5 | 3.0% |
| **1979** | 1,093 | 325 | 26 | 1,281.5 | 2.0% |
| **1980** | 1,138 | 281 | 43 | 1,321.5 | 3.3% |
| **1981** | 1,090 | 267 | 68 | 1,291.5 | 5.3% |
| **1982** | 1,128 | 397 | 56 | 1,382.5 | 4.1% |
| **1983** | 1,023 | 295 | 34 | 1,204.5 | 2.8% |
| **1984** | 967 | 244 | 38 | 1,127.0 | 3.4% |
| **1985** | 858 | 247 | 27 | 1,008.5 | 2.7% |
| **1986** | 829 | 254 | 16 | 972.0 | 1.6% |
| **1987** | 743 | 284 | 35 | 920.0 | 3.8% |
| **1988** | 961 | 272 | 37 | 1,134.0 | 3.3% |
| **1989** | 958 | 284 | 74 | 1,174.0 | 6.3% |
| **1990** | 1,035 | 301 | 62 | 1,247.5 | 5.0% |
| **1991** | 1,095 | 317 | 58 | 1,311.5 | 4.4% |
| **1992** | 1,261 | 383 | 63 | 1,515.5 | 4.2% |
| **1993** | 1,272 | 391 | 60 | 1,527.5 | 3.9% |
| **1994** | 1,264 | 384 | 47 | 1,503.0 | 3.1% |
| **1995** | 1,234 | 356 | 114 | 1,526.0 | 7.5% |

Source:

State Health Planning and Development Agency, 1994, H-11.

State Health Planning and Development Agency, 1995, H-2.

## RESPIRATORY CARE PERSONNEL

Respiratory care practitioners, including respiratory therapists and respiratory therapy technicians, work to evaluate, treat and care for patients with breathing disorders. While most respiratory care practitioners work in hospitals, an increasing number of them have moved into alternate care settings, such as nursing homes, physicians' offices, home health care agencies, patient homes, and medical supply companies. The American Association for Respiratory Care (AARC) is the major professional organization for respiratory care professionals.

### EDUCATION

Respiratory care has two active levels of practitioners: respiratory therapists and respiratory therapy technicians. Technicians undergo a 12-18 month program of study and receive a diploma or certificate upon completion. After graduation, respiratory therapy personnel may take the national professional examination offered by the National Board for Respiratory Care (NBRC) that leads to the "certified respiratory therapy technician" (CRTT) credential. Graduates of the four-year baccalaureate degree programs, after successfully passing the CRTT examination, may take the national registry examination that leads to the "registered respiratory therapist" (RRT) credential. Technicians with CRTT certification after a period of active practice may pursue the RRT credential through a variety of pathways outlined by the NBRC.

Nationwide, nearly 400 community colleges and universities offer respiratory care programs (AARC, 1996). Three associate degree programs and 2 baccalaureate programs are offered in Alabama (Map 3). A total of 565 students have graduated over the past 10 years, averaging 44 per year during the 1986-90 period and 78 per year from 1991-95. Almost two-thirds of all of the awards have been at the associate degree level (Table 13).

Based on information from the program directors, a total of 117 slots are available on an annual basis for study in this field; 79 of those are located in associate degree programs (Table 14). Wallace State-Hanceville reports the largest capacity at 40 slots. All of the educational programs admit students in the Fall. Because graduates of both baccalaureate and associate degree programs may fill entry-level positions, both types of programs are included in this assessment.

## Professional Supply

According to the National Board of Respiratory Care, one of the respiratory therapy credentialing examinations is the standard for licensure in the 42 states that regulate the respiratory therapy profession. Practice in Alabama is not regulated by licensure as is done in the surrounding states of Georgia, Mississippi, Florida, and Tennessee. Georgia is regulated by the Composite State Board of Medical Examiners, and applicants are required to be credentialed by the National Board for Respiratory Care, and/or meet other specified qualifications.

Since its inception in 1960, the National Board for Respiratory Care (NBRC) has issued approximately 200,000 professional credentials to approximately 120,000 individuals. Nationwide, approximately 62,000 have been credentialed as registered respiratory therapists (RRT) and about 133,000 as certified respiratory therapy technicians (CRTT). Over 2,600 have been credentialed by the NBRC in Alabama: 883 RRTs and 1,775 CRTTs (November, 1996). All registrants are not necessarily active in the workforce. The American Association for Respiratory Care estimates that 100,000 respiratory care personnel are active nationwide (AARC, S. Milligan, 1996).

The number of CRTTs and RRTs who have become registered in Alabama and the region is shown in Table 15. At 42 CRTTs and 21 RRTs per 100,000 population, Alabama is somewhat below the practitioner-to-population rate of those certified and registered nationally, and is lower than most of the surrounding states (Figure 3). As stated above, Alabama does not have licensure for this profession and the actual number working in respiratory care is unknown. Alabama's lack of licensure is somewhat reflected in the lower rates of NBRC certification and registration. Passing a national certification exam is frequently a criteria for licensure, and states with licensing requirements are likely to have more graduates seeking registration and at the same time on-the-job training is curtailed.

## Workforce Demand

The American Association for Respiratory Care estimates that 80 percent of respiratory personnel are employed in hospitals and approximately 6 percent of their membership reports employment in home health care agencies (AARC, S. Milligan, 1996); thus, hospital data are an important measure of demand for this profession. Data from the Alabama State Health

Planning and Development Agency show that the demand for respiratory therapists has vacillated from a high of 8.9 percent in 1979 to a low of 2.2 percent in 1994. In 1995, a total of 50 vacancies were reported, a 4.5 percent rate (Table 16). For the same time period in Georgia, the vacancy rate was only slightly higher at 5.5 percent (Morris and Little, 1997).

Over the past 18 years, hospital demand for respiratory care personnel was highest between 1978 and 1981, moving between 6 and 9 percent annually. Over the past six years (1990-1995), vacancies have never exceeded a total of 50, and the vacancy rate has not exceeded 5 percent. Vacancy rates below 5 percent are considered low, reflecting normal turnover and attrition. It should be noted that SHPDA data do not distinguish between CRTT and RRT or non-certified practitioners prepared at two-year or four-year programs.

The Alabama Department of Industrial Relations, Research and Statistics Division, estimates that average annual job openings for respiratory care personnel number 90, with 55 due to growth and 35 due to separations (ADIR, 1996).

### Educational Programs Survey

All five educational programs participated in the survey. When asked about class size, one program director noted that they might increase the entering class by 20+ students based on their capacity. Another program indicated that based on employment opportunities they were considering decreasing the class size by 5-10 students. Others indicated that they would remain the same. Thus, the total number enrolled annually in this field could reach 140. In listing the capacities by program, the Joint Review Committee for Respiratory Therapy Education reports that capacity in the existing Alabama programs is over 200. Individual programs generally admit fewer than their capacity, due to limitations on faculty-student ratios, clinical opportunities, and job market conditions.

As part of the educational program survey, the directors were asked about the supply of respiratory therapy personnel in their region and in the state. Only one director noted a "slight undersupply" in their region; all others noted that based on their professional experience the supply was "adequate" for the regional demand. In estimating the state supply, three of five directors tended to believe that a "small undersupply" might characterize the state's professional supply, while two directors reported that the statewide supply was "adequate." Several directors noted that graduates were able to find jobs, but the market was somewhat tight.

The program directors and the hospital recruiters both identified Birmingham as an area with a small undersupply based on the high demand from the large number of hospitals and the concentration of population in that large MSA, Metropolitan Statistical Area. Almost one million people, 23 percent of Alabama's population, live in the five counties comprising the Birmingham MSA. The directors also noted that the challenge in the field now is to educate future respiratory care personnel with a diversity of skills for a variety of settings (e.g., intensive care units, home care, sleep labs, cardiopulmonary labs).

The program directors noted that employment opportunities in their region and in the state were approximately balanced, and that programs are able to meet the current demand. Although the directors described a balance in supply and demand generally, they noted a steady demand for respiratory graduates in Alabama. One director noted the growth areas of gerontology, home care, nursing home care and long term rehabilitation for respiratory therapy practice. It was believed that these growth areas would offset any loss of employment due to downsizing and managed care in hospitals. One program director described the situation as follows: "despite the flux in health care delivery, the employment prospects look promising for the future in respiratory care. Our presence in the intensive care units appears solid. We are also playing a larger role in therapeutic evaluation and staff education."

In discussing the problems associated with supply and demand, two directors noted the lack of state licensure for respiratory therapists and the fact that there are "still several hospitals that hire people in off the street and train them as respiratory technicians." It should be noted that those trained at the baccalaureate level would be more likely to fill positions requiring supervisory skills and experiences. The associate degree program directors were concerned about the extent of untrained people working in respiratory services in Alabama hospitals and the difficulties that this created for accredited programs in trying to estimate the workforce demand and to ensure quality in the workforce.

The problem of on-the-job training was echoed by some in the hospital sector who noted their desire for "qualified" people. Home health care respondents generally agreed that they were able to meet their needs for respiratory therapy personnel stating that "other allied health areas, such as occupational therapy and physical therapy are much more difficult to satisfy."

## SUMMARY

The supply of respiratory therapists in Alabama appears to be in near balance with demand. In recent years, the hospital vacancy rates in this profession were low, and none of the interviews or survey data described serious imbalances in supply and demand. The data presently do not support the need for a greater number of respiratory therapists graduating from the state's current educational programs in the state. None of those interviewed or surveyed (i.e., program directors, recruiters, employers) cited a large undersupply either in their region or in the state. The picture that emerged was one of "balance" to a small undersupply in some sections of the state.

The current programs are distributed in the north, and extreme southeast and southwest portions of the state. Perhaps the most surprising finding was the absence of any programs in the south central portion of the state, stretching from Lee county through the Montgomery MSA to Sumter county. Approximately 8 percent of Alabama's population lives in the Montgomery MSA. (or roughly 1 in 10 Alabamians). The expressed demand for additional respiratory therapy personnel in Alabama at this time would not justify the establishment of a new program, but the existing programs might explore partnering with other sites to offer respiratory therapy through distance education, as was done in the past between Shelton State Community College and the University of Alabama-Birmingham. A distance education program would increase access for students located in the south central portion of Alabama. Regional variations in supply could perhaps be addressed by distance education. Additionally, state or regional undersupplies that might emerge could be addressed by funding existing programs to increase to their approved capacity

The demand for the current level of graduates should remain strong in Alabama as the demand for qualified personnel increases, new employment settings emerge, and as openings due to attrition and retirement occur. Opportunities for graduates and program strength, however, could be jeopardized by the opportunity to practice in a field without graduation from an accredited program or without meeting certification or licensure standards.

## MAP 3

## RESPIRATORY THERAPIST PROGRAMS*

** Programs shown are accredited by the Joint Review Committee for Respiratory Therapy Education.*

TABLE 13

Respiratory Therapy Technician

Alabama

| Year | Institution | Award > 1 Award < 2 | Associate | Bachelor | Total |
|---|---|---|---|---|---|
| 1986-87 | Gadsden State Community College | | 2 | | |
| | University of Alabama at Birmingham | 16 | | | |
| | University of South Alabama | | | 6 | |
| | Wallace State Community College/Dothan | | 10 | | |
| | Wallace State Community College/Hanceville | | 17 | | |
| | Total | 16 | 29 | 6 | 51 |
| 1987-88 | University of Alabama at Birmingham | 16 | | | |
| | University of South Alabama | | | 8 | |
| | Wallace State Community College/Dothan | | 13 | | |
| | Total | 16 | 13 | 8 | 37 |
| 1988-89 | University of Alabama at Birmingham | 10 | | | |
| | University of South Alabama | | | 6 | |
| | Wallace State Community College/Dothan | | 11 | | |
| | Wallace State Community College/Hanceville | | 3 | | |
| | Total | 10 | 14 | 6 | 30 |
| 1989-90 | University of Alabama at Birmingham | 14 | | | |
| | University of South Alabama | | | 9 | |
| | Wallace State Community College/Dothan | | 8 | | |
| | Wallace State Community College/Hanceville | 0 | 26 | | |
| | Total | 14 | 34 | 9 | 57 |
| 1990-91 | Jefferson State Community College | | 3 | | |
| | University of Alabama at Birmingham | 10 | | | |
| | University of South Alabama | | | 6 | |
| | Wallace State Community College/Dothan | | 13 | | |
| | Wallace State Community College/Hanceville | | 21 | | |
| | Total | 10 | 37 | 6 | 53 |
| 1991-92 | University of Alabama at Birmingham | 15 | | | |
| | University of South Alabama | | | 10 | |
| | Wallace State Community College/Dothan | | 20 | | |
| | Wallace State Community College/Hanceville | | 39 | | |
| | Total | 15 | 59 | 10 | 84 |
| 1992-93 | L.B. Wallace State Junior College | | 1 | | |
| | University of Alabama at Birmingham | 18 | | | |
| | University of South Alabama | | | 9 | |
| | Wallace State Community College/Dothan | | 22 | | |
| | Wallace State Community College/Hanceville | | 49 | | |
| | Total | 18 | 72 | 9 | 99 |

**TABLE 13, cont.**

**Respiratory Therapy Technician**

| Year | Institution | Award > 1 Award < 2 | Associate | Bachelor | Total |
|---|---|---|---|---|---|
| 1993-94 | University of Alabama at Birmingham | 28 | | | |
| | University of South Alabama | | | 10 | |
| | Wallace State Community College/Dothan | | 14 | | |
| | Wallace State Community College/Hanceville | | 37 | | |
| | Total | 28 | 51 | 10 | 89 |
| 1994-95 | Shelton State Community College | | 11 | | |
| | University of South Alabama | | | 20 | |
| | Wallace State Community College/Dothan | | 11 | | |
| | Wallace State Community College/Hanceville | | 23 | | |
| | Total | 0 | 45 | 20 | 65 |
| 1985-96 | **Total** | **127** | **354** | **84** | **565** |

Source:

1985-1986: HEGIS Degrees and Other Formal Awards Conferred, 1986. Unpublished raw data.

1987-1996: Integrated Postsecondary Education Data System (IPEDS), 1987-1996. Unpublished raw data.

Note: CIP Code = 51.0908

**TABLE 14**

**Educational Programs in Respiratory Therapy**

| Institution | Degree Programs | Slots* |
|---|---|---|
| *George C. Wallace State Community College* Dothan | Associate Degree | 22 |
| *George C. Wallace State Community College* Hanceville | Associate Degree | 40 |
| *Shelton State Community College* Tuscaloosa | Associate Degree | 17 |
| *University of Alabama* Birmingham | Baccalaureate | 20 |
| *University of South Alabama* Mobile | Baccalaureate | 18 |

Source: Alabama Commission on Higher Education

* Average number of slots as reported by survey respondents.

**TABLE 15**
**Respiratory Therapy Personnel in the Southeast**
**1996**

| State | 1995 Population | CRTT* | Rate per 100,000 Population | RTT* | Rate per 100,000 Population |
|---|---|---|---|---|---|
| **Alabama** | 4,253,000 | 1,775 | 41.7 | 883 | 20.8 |
| **Georgia** | 7,201,000 | 3,602 | 50.0 | 1,862 | 25.9 |
| **Mississippi** | 2,697,000 | 1,728 | 64.1 | 547 | 20.3 |
| **North Carolina** | 7,195,000 | 2,913 | 40.5 | 1,678 | 23.3 |
| **South Carolina** | 3,673,000 | 1,921 | 52.3 | 1,062 | 28.9 |
| **Tennessee** | 5,256,000 | 3,057 | 58.2 | 1,395 | 26.5 |
| **United States** | **262,755,270** | **133,300** | **50.7** | **62,125** | **23.6** |

Source: National Board for Respiratory Care, Personnel Communication, 11/96.
* CRTT - Certified Respiratory Therapy Technician
* RTT - Registered Respiratory Therapist

**FIGURE 3**
**Respiratory Therapists per 100,000 Population**

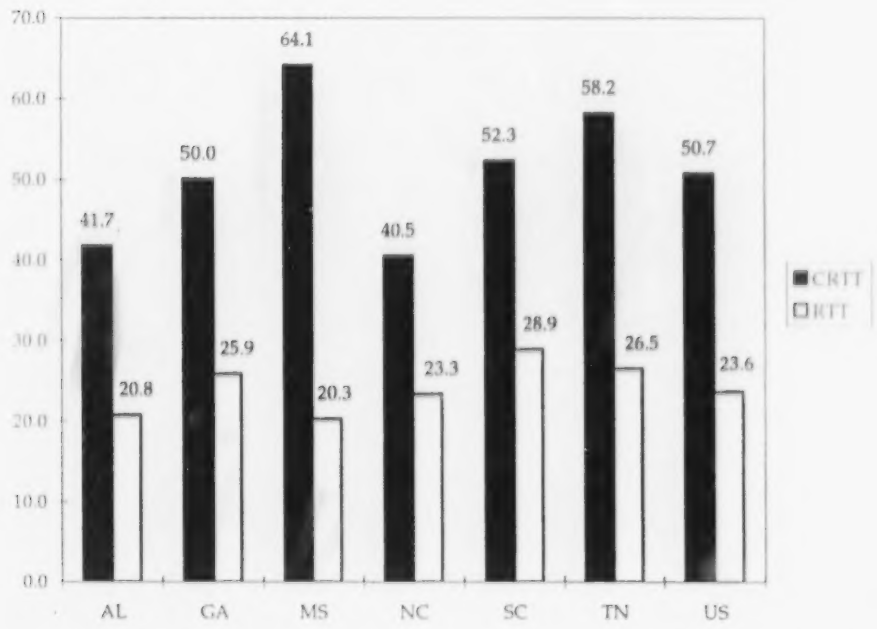

**TABLE 16**
**Alabama Hospital Staffing Trends, 1978-1995**
**Respiratory Therapy**

| Year | Full-time | Part-time | Vacancies | FTE | Vacancy Rate % |
|---|---|---|---|---|---|
| 1978 | 427 | 50 | 31 | 483.0 | 6.4% |
| 1979 | 423 | 53 | 44 | 493.5 | 8.9% |
| 1980 | 504 | 67 | 41 | 578.5 | 7.1% |
| 1981 | 585 | 69 | 40 | 659.5 | 6.1% |
| 1982 | 651 | 102 | 31 | 733.0 | 4.2% |
| 1983 | 639 | 85 | 32 | 713.5 | 4.5% |
| 1984 | 656 | 90 | 24 | 725.0 | 3.3% |
| 1985 | 675 | 124 | 19 | 756.0 | 2.5% |
| 1986 | 692 | 110 | 22 | 769.0 | 2.9% |
| 1987 | 671 | 107 | 26 | 750.5 | 3.5% |
| 1988 | 723 | 162 | 67 | 871.0 | 7.7% |
| 1989 | 769 | 172 | 60 | 915.0 | 6.6% |
| 1990 | 791 | 205 | 44 | 937.5 | 4.7% |
| 1991 | 860 | 212 | 32 | 998.0 | 3.2% |
| 1992 | 915 | 259 | 27 | 1,071.5 | 2.5% |
| 1993 | 918 | 261 | 35 | 1,083.5 | 3.2% |
| 1994 | 931 | 256 | 24 | 1,083.0 | 2.2% |
| 1995 | 939 | 257 | 50 | 1,117.5 | 4.5% |

Source:
State Health Planning and Development Agency, 1994, H-11.
State Health Planning and Development Agency, 1995, H-2.

## OCCUPATIONAL THERAPY ASSISTANTS

Occupational therapy aims to restore or increase muscle strength and motor ability in physically disabled people so that they may perform required daily activities. Occupational therapy uses everyday activities to assist people with physical and/or mental disabilities to achieve independence. Occupational therapy assistants (OTAs) are supervised by occupational therapists (OTs), and they may also provide some evaluations, as well as planning and carrying out treatment programs. Both therapists and assistants must graduate from an accredited education program and pass a national certification examination.

### EDUCATION

Nationally, the number of schools offering accredited educational programs for occupational therapy assistants grew from 22 in 1970 to 94 in 1994 (AOTA, 1995). In 1993-94, AOTA (1995) accredited 17 additional schools for technical-level education and the total number of graduates increased by more than one-quarter over the previous year. Graduates increased from 254 in 1970 to 2,103 in 1994 (AOTA, 1995). Total enrollment grew from 2,595 in 1985 to 6,620 in 1994 (Health Policy Alternatives, 1996).

Two occupational therapy assistant programs are offered in Alabama: Wallace State Community College-Hanceville and Jefferson State Community College, Birmingham (Map 4). Presently, the programs report 40 and 18, respectively, as the average number for enrollment (Table 17). The reported capacity was slightly over 100 students annually, if resources allowed (e.g., faculty, clinical rotations).

Between 1985 and 1996, a total of 254 students graduated in occupational therapy assisting; most of these graduates came through the UAB linkage program (Table 18). In 1995-96, Wallace State Community College-Hanceville produced two graduation classes of 32 and 39 students each. Jefferson State Community College's first class will graduate in June 1997 and will sit for the certification exam in September 1997. Currently, Wallace State Community College-Hanceville admits students in the fall quarter, and Jefferson State in the spring quarter.

Because occupational therapy assistants must be supervised by occupational therapists, the balance between OTAs and OTs is important. Currently, there are three active occupational therapy programs, i.e., University of South Alabama, Tuskegee University, and University of

Alabama-Birmingham. Alabama State University in Montgomery has preliminary approval for the development of an OT program.

## Professional Supply

According to the American Occupational Therapy Association (AOTA, 1996), the certified occupational therapy assistant (COTA) workforce numbers 13,087 nationwide, with 11,673 considered active (4.4 per 100,000 population). The AOTA estimates Alabama's COTA active workforce at 151 (3.6 per 100,000) (Table 19). Using Alabama licensure data, 200 COTAs were active in 1996 (4.7 per 100,000 population) (Table 20). The regional disparities are noted in Table 21: a total of 151 of the 200 licensed COTAs are in North Alabama, yielding a rate of 6.1 per 100,000 population. South Alabama claims a total of 49 COTAs, a low 2.7 per 100,000 population. Thirty of the 49 COTAs in South Alabama are shared by Montgomery and Mobile (Table 22). In North Alabama, 112 of the 151 COTAs are in Jefferson and Madison counties.

In examining the distribution of COTAs according to licensure data, it is noteworthy that COTAs are located in 22 Alabama counties, and that three-fourths of the state's supply are located in four counties: Jefferson, Montgomery, Madison, and Mobile (Table 23). It is important to remember, however, that COTAs may travel with a contract agency or other health care provider and services may be available in counties not listed.

The AOTA data may be used to compare Alabama to other southern states. It is noteworthy that Alabama has more COTAs per 100,000 population than most of the surrounding states, and that only Tennessee approaches the national rate of 4.4 per 100,000 population (Figure 4). Alabama's leadership in this field is due to the early involvement of the University of Alabama-Birmingham in this type of education. Several studies in Georgia have noted the severe shortage in that state of COTAs in both urban and rural areas (Morris and Little, 1996; Morris, 1992). For comparative purposes, the rate of OTs per population is provided in Table 19. Most of the southern states are at one-half of the national rate of 16.8 OTs per 100,000 population.

Examining the relationship of assistants to therapists is important in that therapists are required to supervise students and graduates in this field. In Alabama, OTs outnumber OTAs by slightly more than two to one; yet, in other states and nationally, OTs generally outnumber OTAs by three or more to one. Thus, any expansion in the number of occupational therapy

assistant students or programs would need to consider the availability of OTs for supervision and clinical practice. Additionally, OT programs in close proximity to OTA programs ease the coordination of supervision.

The ideal ratio of therapists to assistants has not been established; however, for many reasons, AOTA is concerned about the rapid expansion of occupational therapy assisting programs and the resulting rapid growth in students and graduates. As noted previously, the number of graduates nationally more than doubled in the past two decades, and based on the young age of the workforce, established positions will not be subject to the same turnover that occurs from retirements in more established fields.

The two OTA programs in the state were surveyed for supply and demand data, and they suggested that currently an undersupply exists statewide; however, they also noted that the north region was rather quickly becoming saturated because of the lower levels of employment overall in this field as compared to allied health fields with larger employment bases (e.g., associate degree nursing, radiography).

### Workforce Demand

Occupational therapy assistants work in a variety of health care settings, including hospitals, nursing homes, schools, and home health care agencies (Table 24). In Alabama, approximately 13 percent are employed by hospitals. Nationally, approximately one-quarter of COTAs are in the hospital setting (Health Policy Alternatives, Inc., 1996). Slightly over one-half of Alabama COTAs report employment with a contract agency, and many of these assistants may work in the hospital setting. The emergence of contract employment increases the difficulty in establishing the demand for occupational therapy assistants.

The State Health Planning and Development Agency's annual staffing reports capture some of the employment in this field in both the hospital setting and nursing home sector. Table 25 shows that the vacancy rate for COTAs has been at or above 9 percent for the past three years in Alabama's hospital sector. This rate, however, represents only 6 to 12 vacancies on an annual basis. In the nursing homes, few COTAs are employed and no vacancies have been reported since 1991 (Table 26). The ability of these settings to employ on an as-needed bases through contract agencies has affected the listing of vacancies and, thus, the vacancy rate.

According to AOTA, national vacancy rates for COTAs range from 9.3 to 30.1 percent, with an average of 17.4 percent. Using two methods to determine demand, AOTA estimates the demand-based shortage of COTAs to be around 17 percent.

During the interview phase of this study, people in the health care industry were asked about the demand for COTAs. Several noted that North Alabama was becoming "flooded" with graduates, and that they did not feel that the region and perhaps the state could accommodate 60+ graduates from the two current programs. At the same time, those interviewed noted the strong demand in South Alabama and the need for regional access to a program and to a small, but steady supply. Also, several noted that expanding a program of OTAs might be difficult due to the limited availability of OTs in Alabama.

## SUMMARY

In 1996, the American Occupational Therapy Association expressed concern about the rapid growth in assisting programs, the current changes in health care that could result in different staffing patterns, and the potential for an oversupply if program expansion and growth in the number of graduates continues unabated into the future. Certainly, programs needed to be sensitive to the supply and demand in their region to avoid creating a significant oversupply. In a small field, like occupational therapy assisting, a single program may produce enough graduates for a state if the program does not limit enrollments and, thus, graduations. A single program, however, may create problems of distribution as noted in North Alabama, where UAB provided the single program for years, and Hanceville and Jefferson State are the only two programs currently.

The addition of a program in central to South Alabama would improve the distribution of programs, increase the accessibility of this program to a larger number of students, and would improve the occupational supply in South Alabama. However, the overall number produced statewide should be closely monitored to ensure that regional oversupplies are not created while underserved regions have little access to programs or professionals. A total of three programs that collectively graduate no more than 60-75 annually would improve distribution and provide an adequate resource base for the state. Also, if demand increased or decreased differentially across the state, three programs would be better positioned to respond to these conflicting demands.

## MAP 4

## OCCUPATIONAL THERAPY (OT) AND OCCUPATIONAL THERAPY ASSISTANT (OTA) PROGRAMS

* *This program has received preliminary approval from the Commission on Higher Education.*

## TABLE 17
## Educational Programs in Occupational Therapy Assisting

| Institution | Slots* |
|---|---|
| *George C. Wallace State Community College* Hanceville | 40 |
| *Jefferson State Community College* Birmingham | 18 |

Source:
AOTA, Occupational Therapy Schools Web Page, 1/97.
Alabama Commission on Higher Education, 7/96.
* Average number of slots as reported by survey respondents.

## TABLE 18
## Occupational Therapy Assistants Alabama

| Year | Institution | Award > 1 Award < 2 | Associate | Total |
|---|---|---|---|---|
| 1985-86 | University of Alabama at Birmingham | 24 | | |
| 1986-87 | University of Alabama at Birmingham | 13 | | |
| 1987-88 | University of Alabama at Birmingham | 13 | | |
| 1988-89 | University of Alabama at Birmingham | 12 | | |
| 1989-90 | University of Alabama at Birmingham | 18 | | |
| 1990-91 | University of Alabama at Birmingham | 18 | | |
| 1991-92 | University of Alabama at Birmingham | 19 | | |
| 1992-93 | University of Alabama at Birmingham | 17 | | |
| 1993-94 | University of Alabama at Birmingham | 25 | | |
| 1994-95 | University of Alabama at Birmingham | 24 | | |
| 1995-96 | Wallace State Community College/Hanceville | | 32 | |
| | | | 39 | |
| 1985-96 | **Total** | 183 | 71 | 254 |

Source:
1985-1986: HEGIS Degrees and Other Formal Awards Conferred, 1986. Unpublished raw data.
1987-1996: Integrated Postsecondary Education Data System (IPEDS), 1987-1996. Unpublished raw data.
Note: CIP Code = 51.0803

TABLE 19
OTR and COTA Personnel in the Southeast
1996

| State | 1995 Population | OTR Workforce | Working | Rate per 100,000 Population | COTA Workforce | Working | Rate per 100,000 Population |
|---|---|---|---|---|---|---|---|
| Alabama | 4,253,000 | 398 | 361 | 8.5 | 169 | 151 | 3.6 |
| Georgia | 7,201,000 | 837 | 760 | 10.6 | 123 | 110 | 1.5 |
| Mississippi | 2,697,000 | 187 | 170 | 6.3 | 32 | 29 | 1.1 |
| North Carolina | 7,195,000 | 934 | 848 | 11.8 | 221 | 197 | 2.7 |
| South Carolina | 3,673,000 | 356 | 323 | 8.8 | 94 | 84 | 2.3 |
| Tennessee | 5,256,000 | 526 | 477 | 9.1 | 252 | 225 | 4.3 |
| United States | 262,755,270 | 48,736 | 44,252 | 16.8 | 13,087 | 11,673 | 4.4 |

Source: AOTA, Occupational Therapy Personnel, 1/95

FIGURE 4
COTA per 100,000 Population

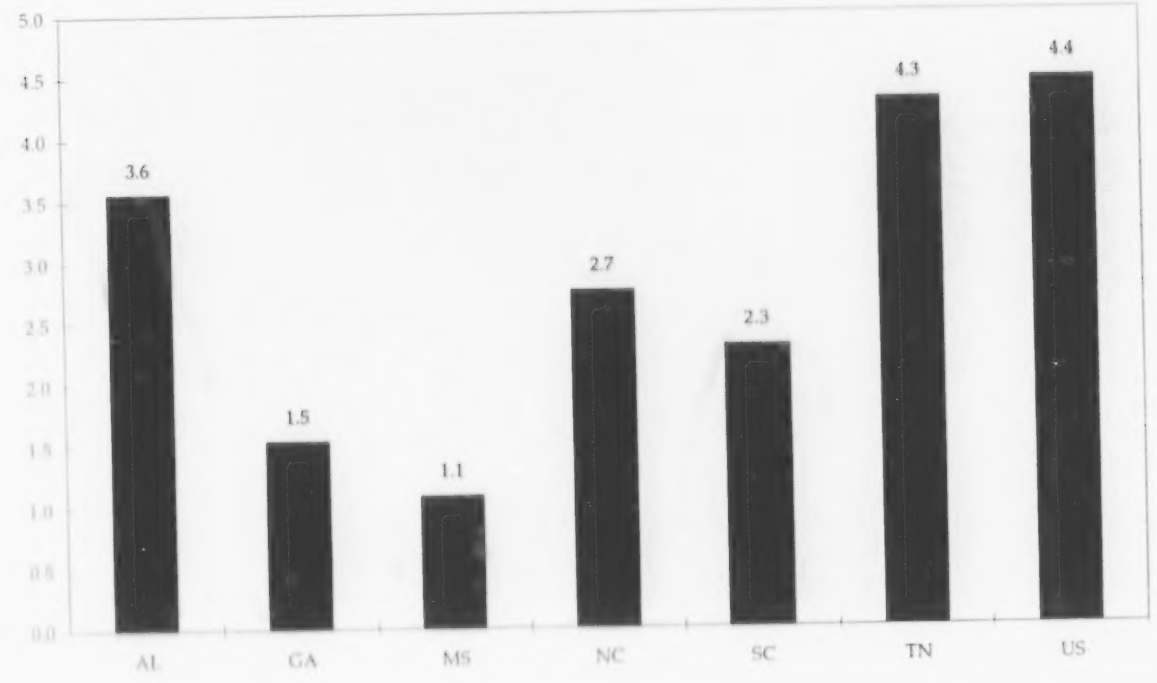

TABLE 20
Occupational Therapy Assistants, 1996
Distribution, All Counties

| County | 1995 Population | OTA | Rate per 100,000 Population | County | 1995 Population | OTA | Rate per 100,000 Population |
|---|---|---|---|---|---|---|---|
| Autauga | 39,381 | 0 | 0.0 | Jackson | 50,128 | 0 | 0.0 |
| Baldwin | 120,198 | 7 | 5.8 | Jefferson | 657,827 | 97 | 14.7 |
| Barbour | 26,469 | 1 | 3.8 | Lamar | 15,754 | 0 | 0.0 |
| Bibb | 17,942 | 0 | 0.0 | Lauderdale | 83,598 | 4 | 4.8 |
| Blount | 42,721 | 1 | 2.3 | Lawrence | 32,803 | 0 | 0.0 |
| Bullock | 11,149 | 0 | 0.0 | Lee | 94,029 | 1 | 1.1 |
| Butler | 21,798 | 0 | 0.0 | Limestone | 59,344 | 0 | 0.0 |
| Calhoun | 117,263 | 3 | 2.6 | Lowndes | 12,946 | 0 | 0.0 |
| Chambers | 37,262 | 0 | 0.0 | Macon | 23,959 | 0 | 0.0 |
| Cherokee | 21,038 | 0 | 0.0 | Madison | 258,340 | 15 | 5.8 |
| Chilton | 34,912 | 1 | 2.9 | Marengo | 23,662 | 0 | 0.0 |
| Choctaw | 16,079 | 0 | 0.0 | Marion | 30,382 | 0 | 0.0 |
| Clarke | 27,993 | 0 | 0.0 | Marshall | 78,195 | 0 | 0.0 |
| Clay | 13,551 | 0 | 0.0 | Mobile | 397,413 | 11 | 2.8 |
| Cleburne | 13,272 | 0 | 0.0 | Monroe | 24,550 | 0 | 0.0 |
| Coffee | 42,359 | 0 | 0.0 | Montgomery | 218,880 | 19 | 8.7 |
| Colbert | 52,586 | 2 | 3.8 | Morgan | 107,034 | 5 | 4.7 |
| Conecuh | 14,022 | 0 | 0.0 | Perry | 12,708 | 0 | 0.0 |
| Coosa | 11,680 | 0 | 0.0 | Pickens | 20,956 | 0 | 0.0 |
| Covington | 37,459 | 1 | 2.7 | Pike | 28,848 | 0 | 0.0 |
| Crenshaw | 13,624 | 0 | 0.0 | Randolph | 20,323 | 0 | 0.0 |
| Cullman | 72,489 | 4 | 5.5 | Russell | 51,436 | 0 | 0.0 |
| Dale | 50,001 | 0 | 0.0 | St. Clair | 57,713 | 0 | 0.0 |
| Dallas | 48,022 | 0 | 0.0 | Shelby | 123,500 | 2 | 1.6 |
| DeKalb | 57,271 | 0 | 0.0 | Sumter | 16,390 | 0 | 0.0 |
| Elmore | 57,071 | 0 | 0.0 | Talladega | 76,737 | 3 | 3.9 |
| Escambia | 36,541 | 0 | 0.0 | Tallapoosa | 39,737 | 0 | 0.0 |
| Etowah | 100,259 | 9 | 9.0 | Tuscaloosa | 158,732 | 4 | 2.5 |
| Fayette | 18,019 | 0 | 0.0 | Walker | 69,678 | 2 | 2.9 |
| Franklin | 29,313 | 0 | 0.0 | Washington | 17,385 | 0 | 0.0 |
| Geneva | 24,727 | 0 | 0.0 | Wilcox | 13,628 | 0 | 0.0 |
| Greene | 10,076 | 0 | 0.0 | Winston | 23,489 | 0 | 0.0 |
| Hale | 16,212 | 0 | 0.0 | | | | |
| Henry | 15,752 | 1 | 6.3 | Total | 4,252,982 | 200 | 4.7 |
| Houston | 84,367 | 7 | 8.3 | | | | |

Source: Alabama State Board of Occupational Therapy; Ann Cosby, Executive Director
Note: OTA Total=239 (200 in-state; 25 out-of-state; 9 not employed, 3 self employed; 2 missing data).

TABLE 21
Occupational Therapy Assistants, 1996
Distribution, North and South Alabama

| North | 1995 Population | OTA | Rate per 100,000 Population |
|---|---|---|---|
| Blount | 42,721 | 1 | 2.3 |
| Calhoun | 117,263 | 3 | 2.6 |
| Cherokee | 21,038 | 0 | 0.0 |
| Clay | 13,551 | 0 | 0.0 |
| Cleburne | 13,272 | 0 | 0.0 |
| Colbert | 52,586 | 2 | 3.8 |
| Cullman | 72,489 | 4 | 5.5 |
| DeKalb | 57,271 | 0 | 0.0 |
| Etowah | 100,259 | 9 | 9.0 |
| Fayette | 18,019 | 0 | 0.0 |
| Franklin | 29,313 | 0 | 0.0 |
| Jackson | 50,128 | 0 | 0.0 |
| Jefferson | 657,827 | 97 | 14.7 |
| Lamar | 15,751 | 0 | 0.0 |
| Lauderdale | 83,598 | 4 | 4.8 |
| Lawrence | 32,803 | 0 | 0.0 |
| Limestone | 59,344 | 0 | 0.0 |
| Madison | 258,340 | 15 | 5.8 |
| Marion | 30,382 | 0 | 0.0 |
| Marshall | 78,195 | 0 | 0.0 |
| Morgan | 107,034 | 5 | 4.7 |
| Pickens | 20,956 | 0 | 0.0 |
| Randolph | 20,323 | 0 | 0.0 |
| Shelby | 123,500 | 2 | 1.6 |
| St. Clair | 57,713 | 0 | 0.0 |
| Talladega | 76,737 | 3 | 3.9 |
| Tuscaloosa | 158,732 | 4 | 2.5 |
| Walker | 69,678 | 2 | 2.9 |
| Winston | 23,489 | 0 | 0.0 |
| North Total n=29 | 2,462,315 | 151 | 6.1 |

| South | 1995 Population | OTA | Rate per 100,000 Population |
|---|---|---|---|
| Autauga | 39,381 | 0 | 0.0 |
| Baldwin | 120,198 | 7 | 5.8 |
| Barbour | 26,469 | 1 | 3.8 |
| Bibb | 17,942 | 0 | 0.0 |
| Bullock | 11,149 | 0 | 0.0 |
| Butler | 21,798 | 0 | 0.0 |
| Chambers | 37,262 | 0 | 0.0 |
| Chilton | 34,912 | 1 | 2.9 |
| Choctaw | 16,079 | 0 | 0.0 |
| Clarke | 27,993 | 0 | 0.0 |
| Coffee | 42,359 | 0 | 0.0 |
| Conecuh | 14,022 | 0 | 0.0 |
| Coosa | 11,680 | 0 | 0.0 |
| Covington | 37,459 | 1 | 2.7 |
| Crenshaw | 13,624 | 0 | 0.0 |
| Dale | 50,001 | 0 | 0.0 |
| Dallas | 48,022 | 0 | 0.0 |
| Elmore | 57,071 | 0 | 0.0 |
| Escambia | 36,541 | 0 | 0.0 |
| Geneva | 24,727 | 0 | 0.0 |
| Greene | 10,076 | 0 | 0.0 |
| Hale | 16,212 | 0 | 0.0 |
| Henry | 15,752 | 1 | 6.3 |
| Houston | 84,367 | 7 | 8.3 |
| Lee | 94,029 | 1 | 1.1 |
| Lowndes | 12,946 | 0 | 0.0 |
| Macon | 23,959 | 0 | 0.0 |
| Marengo | 23,662 | 0 | 0.0 |
| Mobile | 397,413 | 11 | 2.8 |
| Monroe | 24,550 | 0 | 0.0 |
| Montgomery | 218,880 | 19 | 8.7 |
| Perry | 12,708 | 0 | 0.0 |
| Pike | 28,848 | 0 | 0.0 |
| Russell | 51,436 | 0 | 0.0 |
| Sumter | 16,390 | 0 | 0.0 |
| Tallapoosa | 39,737 | 0 | 0.0 |
| Washington | 17,385 | 0 | 0.0 |
| Wilcox | 13,628 | 0 | 0.0 |
| South Total n=38 | 1,790,667 | 49 | 2.7 |

TABLE 22

Occupational Therapy Assistants, 1996

North and South Alabama, Descending Order

| North | 1995 Population | OTA | Rate per 100,000 Population |
|---|---|---|---|
| Jefferson | 657,827 | 97 | 14.7 |
| Madison | 258,340 | 15 | 5.8 |
| Etowah | 100,259 | 9 | 9.0 |
| Morgan | 107,034 | 5 | 4.7 |
| Cullman | 72,489 | 4 | 5.5 |
| Lauderdale | 83,598 | 4 | 4.8 |
| Tuscaloosa | 158,732 | 4 | 2.5 |
| Calhoun | 117,263 | 3 | 2.6 |
| Talladega | 76,737 | 3 | 3.9 |
| Colbert | 52,586 | 2 | 3.8 |
| Shelby | 123,500 | 2 | 1.6 |
| Walker | 69,678 | 2 | 2.9 |
| Blount | 42,721 | 1 | 2.3 |
| North Total n=13 | | 151 | |

| South | 1995 Population | OTA | Rate per 100,000 Population |
|---|---|---|---|
| Montgomery | 218,880 | 19 | 8.7 |
| Mobile | 397,413 | 11 | 2.8 |
| Baldwin | 120,198 | 7 | 5.8 |
| Houston | 84,367 | 7 | 8.3 |
| Barbour | 26,469 | 1 | 3.8 |
| Chilton | 34,912 | 1 | 2.9 |
| Covington | 37,459 | 1 | 2.7 |
| Henry | 15,752 | 1 | 6.3 |
| Lee | 94,029 | 1 | 1.1 |
| South Total n=9 | | 49 | |

TABLE 23

Occupational Therapy Assistants, 1996

Numbers by County, Descending Order

| County | 1995 Population | OTA | Rate per 100,000 Population |
|---|---|---|---|
| Jefferson | 657,827 | 97 | 14.7 |
| Montgomery | 218,880 | 19 | 8.7 |
| Madison | 258,340 | 15 | 5.8 |
| Mobile | 397,413 | 11 | 2.8 |
| Etowah | 100,259 | 9 | 9.0 |
| Baldwin | 120,198 | 7 | 5.8 |
| Houston | 84,367 | 7 | 8.3 |
| Morgan | 107,034 | 5 | 4.7 |
| Cullman | 72,489 | 4 | 5.5 |
| Lauderdale | 83,598 | 4 | 4.8 |
| Tuscaloosa | 158,732 | 4 | 2.5 |
| Calhoun | 117,263 | 3 | 2.6 |
| Talladega | 76,737 | 3 | 3.9 |
| Colbert | 52,586 | 2 | 3.8 |
| Shelby | 123,500 | 2 | 1.6 |
| Walker | 69,678 | 2 | 2.9 |
| Barbour | 26,469 | 1 | 3.8 |
| Blount | 42,721 | 1 | 2.3 |
| Chilton | 34,912 | 1 | 2.9 |
| Covington | 37,459 | 1 | 2.7 |
| Henry | 15,752 | 1 | 6.3 |
| Lee | 94,029 | 1 | 1.1 |
| Total, n=22 | | 200 | |

Note: OTA Total=239 (200 in-state; 25 out-of-state; 9 not employed; 3 self employed; 2 missing data).

TABLE 24

Alabama Occupational Therapy Assistants

Workforce Distribution by Sector

| Sector | Number | Percent |
|---|---|---|
| Hospitals | 28 | 12.6 |
| Outpatient/Private Practice | 34 | 15.3 |
| Contracts to Medical Facilities and Nursing Facilities | 119 | 53.6 |
| Temporary Contracts | 9 | 4.1 |
| Nursing Facilities | 15 | 6.8 |
| Academic Faculty | 3 | 1.4 |
| School System | 6 | 2.7 |
| Home Health | 2 | 0.9 |
| Unknown/Misc. | 6 | 2.7 |
| **Total** | **222** | **100.0** |

Source: Alabama State Board of Occupational Therapy

## TABLE 25
## Alabama Hospital Staffing Trends, 1978-1995
## Occupational Therapy Assistants

| Year | Full-time | Part-time | Vacancies | FTE | Vacancy Rate % |
|---|---|---|---|---|---|
| 1978 | 39 | 5 | 0 | 41.5 | 0.0% |
| 1979 | 29 | 2 | 0 | 30.0 | 0.0% |
| 1980 | 26 | 1 | 2 | 28.5 | 7.0% |
| 1981 | 33 | 1 | 0 | 33.5 | 0.0% |
| 1982 | 36 | 1 | 3 | 39.5 | 7.6% |
| 1983 | 29 | 3 | 0 | 30.5 | 0.0% |
| 1984 | 24 | 0 | 0 | 24.0 | 0.0% |
| 1985 | 36 | 4 | 2 | 40.0 | 5.0% |
| 1986 | 27 | 0 | 4 | 31.0 | 12.9% |
| 1987 | 36 | 17 | 6 | 50.5 | 11.9% |
| 1988 | 56 | 9 | 2 | 62.5 | 3.2% |
| 1989 | 49 | 10 | 7 | 61.0 | 11.5% |
| 1990 | 63 | 11 | 8 | 76.5 | 10.5% |
| 1991 | 67 | 5 | 8 | 77.5 | 10.3% |
| 1992 | 65 | 3 | 2 | 68.5 | 2.9% |
| 1993 | 69 | 9 | 12 | 85.5 | 14.0% |
| 1994 | 57 | 11 | 7 | 69.5 | 10.1% |
| 1995 | 55 | 10 | 6 | 66.0 | 9.1% |

Source:
State Health Planning and Development Agency, 1994, H-11.
State Health Planning and Development Agency, 1995, H-2.

**TABLE 26**

**Alabama Nursing Home Staffing Trends, 1989-1995**

**Occupational Therapy Assistants**

| Year | Full-time | Part-time | Vacancies | FTE | Vacancy Rate % |
|---|---|---|---|---|---|
| **1989** | 10 | 0 | 2 | 12.0 | 16.7% |
| **1990** | 7 | 2 | 0 | 8.0 | 0.0% |
| **1991** | 9 | 7 | 1 | 13.5 | 7.4% |
| **1992** | 25 | 4 | 0 | 27.0 | 0.0% |
| **1993** | 28 | 3 | 0 | 29.5 | 0.0% |
| **1994** | 34 | 9 | 0 | 38.5 | 0.0% |
| **1995** | 35 | 10 | 0 | 40.0 | 0.0% |

Source: State Health Planning and Development Agency, 1995, NH-7.

Note: data include OT aides

## PHYSICAL THERAPIST ASSISTANTS

Physical therapist assistants (PTAs) are skilled health care professionals who assist physical therapists in implementing treatment programs, training patients in exercises and activities of daily living, conducting treatment, and reporting to the physical therapist on the patient's response. Physical therapists assistants work under the supervision of physical therapists (APTA, 1996).

### EDUCATION

The Commission on Accreditation in Physical Therapy Education (CAPTE) is the recognized accrediting agency for education programs in physical therapy. Physical therapist assistants must complete a two-year education program which generally includes one year of general education and one year of technical courses on physical therapy procedures and clinical experience. Graduates receive an associate degree.

Nationwide, there are 207 accredited PTA programs and 71 developing programs (*PT Bulletin*, 1997). The number of PTA programs nationally has tripled since 1985 when 67 were accredited (APTA, 1994). Educational data show that the number of graduates increased from 1,805 in 1990 to 3,396 in 1995 (APTA, 1996). Only 900 graduated in 1985, growing 275 percent between 1985 and 1995.

Map 5 shows the location of both physical therapy programs and physical therapist assistant programs in Alabama. A reasonable balance between productivity in physical therapy programs relative to assistant programs is important as assistants are required by law to be supervised by physical therapists. As of December 1996, there were 164 accredited and 58 developing physical therapist programs nationwide; consequently, PTA programs now outnumber PT programs across the United States (PT Bulletin, 1997). Two physical therapy programs in Alabama are fully accredited: University of Alabama-Birmingham and University of South Alabama. A program at the University of Mobile has candidate status, and Alabama State University (Montgomery) has preliminary approval from the Alabama Commission on Higher Education.

Physical therapist assisting programs are offered at four community colleges in Alabama: Jefferson State Community College, Bishop State Community College, Wallace State Community College-Dothan, Wallace State Community College-Hanceville (Table 27).

Hanceville has the largest program, admitting 80 students in the fall. Bishop State offers two classes per year (fall and spring) and averages 32 in each class. Jefferson State and Dothan admit 16 and 24, respectively, in the summer term. Collectively, the four programs may admit 184 students annually. Due to attrition, common to all programs, somewhat less than this number would graduate annually.

Table 28 shows that during the linkage program less than 50 students graduated annually in physical therapist assisting. Recently, this number has almost tripled. In 1994-95, 123 students graduated, and in 1996 a total of 133 students graduated from Bishop and Hanceville. The two new programs, Jefferson State Community College and Wallace State Community College-Dothan, will add 35-40 students, bringing the total number of graduates to 150 annually.

*Workforce Supply*

A total of 21,603 physical therapist assistants are regulated in the U.S., Virgin Islands, District of Columbia, and Puerto Rico, approximately 8.2 PTAs per 100,000 (Table 29) (Gwyer, 1995). Nationally, the PT workforce is much larger at an estimated 90,210 active professionals (APTA, 1996). The Bureau of Labor Statistics classifies physical therapy assistants and aides together and estimates a total of 78,000 working in this category in 1994 (MLR, 1995). Growth in this category and for physical therapists is projected to be among the greatest between the years 1995-2005; however, the Bureau and the American Physical Therapy Association note that previous shortages and future growth are being better accommodated by the increase in education programs and the increase in graduates. In physical therapist assisting, the rapid growth in programs may alleviate shortages rather rapidly in the future.

Physical therapist assistants are regulated for practice in over 40 states, and Alabama is one of the states that requires licensure for practice (*PT Bulletin*, 1997). All of the states in the southeast require licensure. As of September 1996, a total of 802 PTAs were licensed for practice in Alabama, and 731 held in-state licensees, yielding a practitioner-to-population ratio of 17 per 100,000 population (Table 30). Based on APTA data and licensure data from surrounding states, Alabama ranks near the top of PTAs per 100,000 population in the Southeast; only Tennessee ranks higher. Alabama's rate of 17.2 per 100,000 is twice as large as the U.S. rate of 8.2 per

100,000 population. As in occupational therapy assisting, the early leadership of UAB in this field of study is reflected in the data and in the larger supply of PTAs in Alabama.

An examination of the distribution of PTAs in Alabama reflects the concentration of population and medical facilities that are located in the northern part of the state. The largest numbers and highest ratios of PTAs are in metropolitan counties with large populations. In combination, Jefferson and Mobile counties account for 38 percent of the active PTA workforce and 26 percent of Alabama's population. In examining those counties above the North-South line, it is observed that 531 PTAs live in the north and 200 PTAs live in the south (Table 31). The large numerical differences noted in the number of PTAs in the north and south result in a much larger practitioner-to-population ratio in the north, 22 per 100,000 as compared to 11 per 100,000 in South Alabama. Statewide, 14 counties reach or exceed the state average of 17 practitioners per 100,000 population; eleven of those counties are in the northern part of the state. All of the counties in North Alabama claim one or more PTAs, while 14 counties in the southern part of the state do not show a PTA. A county without a PTA may, however, be served by a contract service and have therapy services available.

Data from the APTA affiliate member survey show that the PTA workforce is young, with one-third less than 29 years of age. Only one-quarter of the workforce is age 40 or above. The relative newness of the field accounts for much of the youth in the workforce and the likelihood that applicants for the field are recent graduates of high school with current skills in the sciences and math, prerequisites that might limit applications by older students. The age of the workforce is also important in considering future supply and demand. Although the field is predominately female, and in the child-bearing years, attrition from the field due to retirement or permanent separation due to other causes is likely to remain low for some time. Thus, the active workforce will grow due to increased graduations and limited numbers of separations annually.

As part of the survey of physical therapist assisting programs, the directors were asked to characterize the supply of PTAs in both their region and in the state. The replies reflected the distribution shown on Table 32. The directors noted that the regions where programs are located are better supplied, and as one moves away from program locations, the supply diminishes. Four directors characterized the state as a whole as having a "small undersupply." Several noted that far too many PTAs were being produced in North Alabama, and that this

posed problems in employment and clinical rotations. Several spoke of the need to improve the distribution in other areas of the state.

### Workforce Demand

Physical therapist assistants practice in a variety of health care settings. A survey of PTA affiliate members by the APTA found that approximately 27 percent work in the hospital setting and approximately 22 percent in nursing facilities; thus, these two settings claim approximately one-half of the workforce. Other settings with significant numbers include rehabilitation centers and private physical therapy offices.

The Alabama hospital and nursing home staffing data suggest that over one-half of the licensed PTAs in the state work in these two settings (Tables 33 and 34), and that the demand expressed by these two sectors is significant in establishing the demand for the state as a whole. Table 33 shows that the vacancy rate for PTAs in Alabama hospitals has varied from 6.41 percent in 1989 to 6.17 percent in the most recent year (1995). Only 7 vacancies were noted in the nursing home setting (Table 34).

The growth in PTA employment in home health care is noteworthy. Between 1989 and 1995, employment increased from 3 to 104 full-time and from 68 to 180 part-time (Table 35). The share of employment that is contractual is even more impressive. In the most recent year, 78 percent of full-time employment (i.e., 81 of 104 positions) was held by contract workers. Almost all of part-time employment was contractual. Contract positions increase the difficulty in estimating workforce demand, for these contractual arrangements often are beyond the scope of standard reporting mechanisms. And, the information that is collected is limited in its usefulness.

To better understand the use of PTAs in contract employment, several contract agencies were contacted. The agencies generally described a strong demand for physical therapists and a somewhat lesser demand for physical therapist assistants. The agencies, however, were most interested in highlighting the demand in South Alabama. None described an undersupply in North Alabama. Some even noted that PTAs in the north "call around looking for a job."

Hospital administrators and recruiters concurred that PTAs are "somewhat undersupplied," and that South Alabama is the most underserved area. This judgement is shared by the program directors who describe the state as having a "small undersupply" and a

larger undersupply was noted for South Alabama, excluding the Mobile area. In South Alabama, Mobile, Baldwin, and Montgomery counties are well-supplied. It was noted, however, that it is in the most populous areas where openings most often occur. One of the program directors noted that supply and demand in allied health are often cyclical and that a real concern across the field was not "to flood the market and have students who cannot find jobs in the field."

The Alabama Department of Industrial Relations estimates that 1,030 are employed in the category "Physical and Corrective Therapy Assistants" with growth to the year 2005 adding an additional 690 jobs. Average annual job openings are estimated at 100 (ADIR, 1996). These data are not very useful for this analysis due to the practice of combining licensed and unlicensed personnel (i.e., aides) in the same category. Important, however, is the fact that only 100 job openings are projected for both "aides" and "assistants."

## Summary

Currently, a small undersupply of physical therapist assistants exists in Alabama, and this imbalance in supply and demand is most prevalent in South Alabama. The overall increase in graduates, combined with the addition of new programs in Mobile and Dothan, will bring supply and demand into balance over the next few years. The creation of two programs in South Alabama has increased educational access for the southern region of Alabama and will improve the distribution of assistants across the southern part of the state. The four programs are well-distributed across the state and they are sufficient to meet the overall statewide demand. It is also important for existing programs to note the increase in programs and graduates nationally and the potential for areas to be oversupplied if programs are not sensitive to regional and state employment demand. Justification for additional programs would be based on extending educational access to other subregions in Alabama.

## MAP 5

## PHYSICAL THERAPY (PT) AND PHYSICAL THERAPIST ASSISTANT (PTA) PROGRAMS

* This program has received preliminary approval from the Commission on Higher Education.

TABLE 27

Educational Programs in Physical Therapist Assisting

| Institution | Accreditation | Implementation | Slots* |
|---|---|---|---|
| *Bishop State Community College* Mobile | Accredited | 1991 | 32** |
| *George C. Wallace State Community College* Dothan | Applicant status | 1996 | 24 |
| *George C. Wallace State Community College* Hanceville | Accredited | 1990 | 80 |
| *Jefferson State Community College* Birmingham | Applicant Status | 1996 | 16 |

Source: American Physical Therapy Association, Web Site, 1/97.

* Average number of slots as reported by survey respondents.

** Admits 2 classes per year at 32 each.

## TABLE 28
## Physical Therapist Assistants
## Alabama

| Year | Institution | Award > 1 Award < 2 | Associate | Total |
|---|---|---|---|---|
| 1985-86 | University of Alabama at Birmingham | 29 | | |
| | Total | 29 | 0 | 29 |
| 1986-87 | University of Alabama at Birmingham | 30 | | |
| | Total | 30 | 0 | 30 |
| 1987-88 | University of Alabama at Birmingham | 34 | | |
| | Total | 34 | 0 | 34 |
| 1988-89 | University of Alabama at Birmingham | 25 | | |
| | Total | 25 | 0 | 25 |
| 1989-90 | University of Alabama at Birmingham | 34 | | |
| | Total | 34 | 0 | 34 |
| 1990-91 | University of Alabama at Birmingham | 32 | | |
| | Total | 32 | 8 | 40 |
| 1991-92 | University of Alabama at Birmingham | 32 | | |
| | Wallace State Community College/Hanceville | | 26 | |
| | Total | 32 | 26 | 58 |
| 1992-93 | Bishop State Community College | | 13 | |
| | University of Alabama at Birmingham | 32 | | |
| | Wallace State Community College/Hanceville | | 14 | |
| | Total | 32 | 27 | 59 |
| 1993-94 | Bishop State Community College | | 27 | |
| | University of Alabama at Birmingham | 31 | | |
| | Wallace State Community College/Hanceville | | 29 | |
| | Total | 31 | 56 | 87 |
| 1994-95 | Bishop State Community College | | 33 | |
| | University of Alabama at Birmingham | 32 | | |
| | Wallace State Community College/Hanceville | | 58 | |
| | Total | 32 | 91 | 123 |

TABLE 28, cont.
Physical Therapist Assistants

| Year | Institution | Award > 1 Award < 2 | Associate | Total |
|---|---|---|---|---|
| 1995-96 | Bishop State Community College | | 39 | |
| | Wallace State Community College/Hanceville | | 69 | |
| | Total | 0 | 108 | 108 |
| 1996- | Bishop State Community College | | 74 | |
| | Wallace State Community College/Hanceville | | 59 | |
| | Total | 0 | 133 | 133 |
| 1985-96 | **Total** | **311** | **449** | 760 |

Source:
1985-1986: HEGIS Degrees and Other Formal Awards Conferred, 1986. Unpublished raw data.
1987-1996: Integrated Postsecondary Education Data System (IPEDS), 1987-1996. Unpublished raw data.
Note: CIP Code = 51.0806

TABLE 29
Physical Therapist Assistants
Practitioner to Population Ratios
1996

| State | 1995 Population | PTA | Rate* |
|---|---|---|---|
| Alabama | 4,253,000 | 731 | 17.2 |
| Georgia | 7,201,000 | 487 | 6.8 |
| Mississippi | 2,697,000 | 278 | 10.3 |
| North Carolina | 7,195,000 | 1,006 | 14.0 |
| South Carolina | 3,673,000 | 556 | 15.1 |
| Tennessee | 5,256,000 | 1,024 | 19.5 |
| United States | 262,755,270 | 21,603 | 8.2 |

Source:
American Physical Therapy Association
Personal Communication, State Licensure Boards
* per 100,000 population

FIGURE 4
Physical Therapist Assistants per 100,000 Population

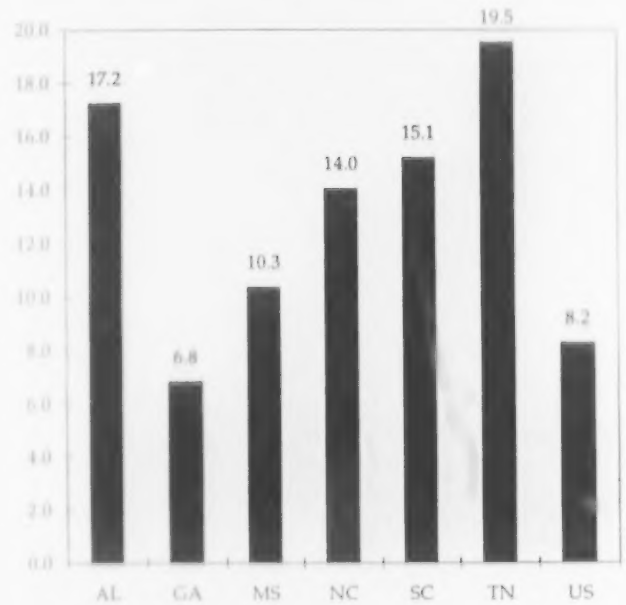

TABLE 30
Physical Therapist Assistants, 1996
Distribution, All Counties

| County | 1995 Population | PTA | Rate per 100,000 Population |
|---|---|---|---|
| Autauga | 39,381 | 1 | 2.5 |
| Baldwin | 120,198 | 27 | 22.5 |
| Barbour | 26,469 | 2 | 7.6 |
| Bibb | 17,942 | 2 | 11.1 |
| Blount | 42,721 | 3 | 7.0 |
| Bullock | 11,149 | 0 | 0.0 |
| Butler | 21,798 | 0 | 0.0 |
| Calhoun | 117,263 | 19 | 16.2 |
| Chambers | 37,262 | 1 | 2.7 |
| Cherokee | 21,038 | 1 | 4.8 |
| Chilton | 34,912 | 5 | 14.3 |
| Choctaw | 16,079 | 0 | 0.0 |
| Clarke | 27,993 | 3 | 10.7 |
| Clay | 13,551 | 1 | 7.4 |
| Cleburne | 13,272 | 1 | 7.5 |
| Coffee | 42,359 | 4 | 9.4 |
| Colbert | 52,586 | 24 | 45.6 |
| Conecuh | 14,022 | 1 | 7.1 |
| Coosa | 11,680 | 0 | 0.0 |
| Covington | 37,459 | 7 | 18.7 |
| Crenshaw | 13,624 | 0 | 0.0 |
| Cullman | 72,489 | 23 | 31.7 |
| Dale | 50,001 | 0 | 0.0 |
| Dallas | 48,022 | 6 | 12.5 |
| DeKalb | 57,271 | 5 | 8.7 |
| Elmore | 57,071 | 2 | 3.5 |
| Escambia | 36,541 | 3 | 8.2 |
| Etowah | 100,259 | 18 | 18.0 |
| Fayette | 18,019 | 1 | 5.5 |
| Franklin | 29,313 | 5 | 17.1 |
| Geneva | 24,727 | 1 | 4.0 |
| Greene | 10,076 | 0 | 0.0 |
| Hale | 16,212 | 0 | 0.0 |
| Henry | 15,752 | 1 | 6.3 |
| Houston | 84,367 | 12 | 14.2 |
| Jackson | 50,128 | 4 | 8.0 |
| Jefferson | 657,827 | 200 | 30.4 |
| Lamar | 15,754 | 1 | 6.3 |
| Lauderdale | 83,598 | 41 | 49.0 |
| Lawrence | 32,803 | 4 | 12.2 |
| Lee | 94,029 | 5 | 5.3 |
| Limestone | 59,344 | 5 | 8.4 |
| Lowndes | 12,946 | 0 | 0.0 |
| Macon | 23,959 | 0 | 0.0 |
| Madison | 258,340 | 45 | 17.4 |
| Marengo | 23,662 | 2 | 8.5 |
| Marion | 30,382 | 7 | 23.0 |
| Marshall | 78,195 | 12 | 15.3 |
| Mobile | 397,413 | 75 | 18.9 |
| Monroe | 24,550 | 0 | 0.0 |
| Montgomery | 218,880 | 30 | 13.7 |
| Morgan | 107,034 | 46 | 43.0 |
| Perry | 12,708 | 1 | 7.9 |
| Pickens | 20,956 | 2 | 9.5 |
| Pike | 28,848 | 0 | 0.0 |
| Randolph | 20,323 | 5 | 24.6 |
| Russell | 51,436 | 3 | 5.8 |
| St. Clair | 57,713 | 1 | 1.7 |
| Shelby | 123,500 | 8 | 6.5 |
| Sumter | 16,390 | 0 | 0.0 |
| Talladega | 76,737 | 12 | 15.6 |
| Tallapoosa | 39,737 | 5 | 12.6 |
| Tuscaloosa | 158,732 | 24 | 15.1 |
| Walker | 69,678 | 12 | 17.2 |
| Washington | 17,385 | 1 | 5.8 |
| Wilcox | 13,628 | 0 | 0.0 |
| Winston | 23,489 | 1 | 4.3 |
| Total | 4,252,982 | 731 | 17.2 |

Source: Alabama State Board of Physical Therapy; Kathryn Brown, Executive Director

Note: PTA Total=802 (731 instate; 69 out-of-state; 2 missing data).

TABLE 31

Physical Therapist Assistants, 1996

Distribution, North and South Alabama

| North | 1995 Population | PTA | Rate per 100,000 Population |
|---|---|---|---|
| Blount | 42,721 | 3 | 7.0 |
| Calhoun | 117,263 | 19 | 16.2 |
| Cherokee | 21,038 | 1 | 4.8 |
| Clay | 13,551 | 1 | 7.4 |
| Cleburne | 13,272 | 1 | 7.5 |
| Colbert | 52,586 | 24 | 45.6 |
| Cullman | 72,489 | 23 | 31.7 |
| DeKalb | 57,271 | 5 | 8.7 |
| Etowah | 100,259 | 18 | 18.0 |
| Fayette | 18,019 | 1 | 5.5 |
| Franklin | 29,313 | 5 | 17.1 |
| Jackson | 50,128 | 4 | 8.0 |
| Jefferson | 657,827 | 200 | 30.4 |
| Lamar | 15,754 | 1 | 6.3 |
| Lauderdale | 83,598 | 41 | 49.0 |
| Lawrence | 32,803 | 4 | 12.2 |
| Limestone | 59,344 | 5 | 8.4 |
| Madison | 258,340 | 45 | 17.4 |
| Marion | 30,382 | 7 | 23.0 |
| Marshall | 78,195 | 12 | 15.3 |
| Morgan | 107,034 | 46 | 43.0 |
| Pickens | 20,956 | 2 | 9.5 |
| Randolph | 20,323 | 5 | 24.6 |
| Shelby | 123,500 | 8 | 6.5 |
| St. Clair | 57,713 | 1 | 1.7 |
| Talladega | 76,737 | 12 | 15.6 |
| Tuscaloosa | 158,732 | 24 | 15.1 |
| Walker | 69,678 | 12 | 17.2 |
| Winston | 23,489 | 1 | 4.3 |
| North Total n=29 | 2,462,315 | 531 | 21.6 |

| South | 1995 Population | PTA | Rate per 100,000 Population |
|---|---|---|---|
| Autauga | 39,381 | 1 | 2.5 |
| Baldwin | 120,198 | 27 | 22.5 |
| Barbour | 26,469 | 2 | 7.6 |
| Bibb | 17,942 | 2 | 11.1 |
| Bullock | 11,149 | 0 | 0.0 |
| Butler | 21,798 | 0 | 0.0 |
| Chambers | 37,262 | 1 | 2.7 |
| Chilton | 34,912 | 5 | 14.3 |
| Choctaw | 16,079 | 0 | 0.0 |
| Clarke | 27,993 | 3 | 10.7 |
| Coffee | 42,359 | 4 | 9.4 |
| Conecuh | 14,022 | 1 | 7.1 |
| Coosa | 11,680 | 0 | 0.0 |
| Covington | 37,459 | 7 | 18.7 |
| Crenshaw | 13,624 | 0 | 0.0 |
| Dale | 50,001 | 0 | 0.0 |
| Dallas | 48,022 | 6 | 12.5 |
| Elmore | 57,071 | 2 | 3.5 |
| Escambia | 36,541 | 3 | 8.2 |
| Geneva | 24,727 | 1 | 4.0 |
| Greene | 10,076 | 0 | 0.0 |
| Hale | 16,212 | 0 | 0.0 |
| Henry | 15,752 | 1 | 6.3 |
| Houston | 84,367 | 12 | 14.2 |
| Lee | 94,029 | 5 | 5.3 |
| Lowndes | 12,946 | 0 | 0.0 |
| Macon | 23,959 | 0 | 0.0 |
| Marengo | 23,662 | 2 | 8.5 |
| Mobile | 397,413 | 75 | 18.9 |
| Monroe | 24,550 | 0 | 0.0 |
| Montgomery | 218,880 | 30 | 13.7 |
| Perry | 12,708 | 1 | 7.9 |
| Pike | 28,848 | 0 | 0.0 |
| Russell | 51,436 | 3 | 5.8 |
| Sumter | 16,390 | 0 | 0.0 |
| Tallapoosa | 39,737 | 5 | 12.6 |
| Washington | 17,385 | 1 | 5.8 |
| Wilcox | 13,628 | 0 | 0.0 |
| South Total n=38 | 1,790,667 | 200 | 11.2 |

## TABLE 32

### Physical Therapist Assistants, 1996

### North and South Alabama, Descending Order

| North | 1995 Population | PTA | Rate per 100,000 Population |
|---|---|---|---|
| Jefferson | 657,827 | 200 | 30.4 |
| Morgan | 107,034 | 46 | 43.0 |
| Madison | 258,340 | 45 | 17.4 |
| Lauderdale | 83,598 | 41 | 49.0 |
| Colbert | 52,586 | 24 | 45.6 |
| Tuscaloosa | 158,732 | 24 | 15.1 |
| Cullman | 72,489 | 23 | 31.7 |
| Calhoun | 117,263 | 19 | 16.2 |
| Etowah | 100,259 | 18 | 18.0 |
| Marshall | 78,195 | 12 | 15.3 |
| Talladega | 76,737 | 12 | 15.6 |
| Walker | 69,678 | 12 | 17.2 |
| Shelby | 123,500 | 8 | 6.5 |
| Marion | 30,382 | 7 | 23.0 |
| DeKalb | 57,271 | 5 | 8.7 |
| Franklin | 29,313 | 5 | 17.1 |
| Limestone | 59,344 | 5 | 8.4 |
| Randolph | 20,323 | 5 | 24.6 |
| Jackson | 50,128 | 4 | 8.0 |
| Lawrence | 32,803 | 4 | 12.2 |
| Blount | 42,721 | 3 | 7.0 |
| Pickens | 20,956 | 2 | 9.5 |
| Cherokee | 21,038 | 1 | 4.8 |
| Clay | 13,551 | 1 | 7.4 |
| Cleburne | 13,272 | 1 | 7.5 |
| Fayette | 18,019 | 1 | 5.5 |
| Lamar | 15,754 | 1 | 6.3 |
| St. Clair | 57,713 | 1 | 1.7 |
| Winston | 23,489 | 1 | 4.3 |
| North Total n=29 | | 531 | |

| South | 1995 Population | PTA | Rate per 100,000 Population |
|---|---|---|---|
| Mobile | 397,413 | 75 | 18.9 |
| Montgomery | 218,880 | 30 | 13.7 |
| Baldwin | 120,198 | 27 | 22.5 |
| Houston | 84,367 | 12 | 14.2 |
| Covington | 37,459 | 7 | 18.7 |
| Dallas | 48,022 | 6 | 12.5 |
| Chilton | 34,912 | 5 | 14.3 |
| Lee | 94,029 | 5 | 5.3 |
| Tallapoosa | 39,737 | 5 | 12.6 |
| Coffee | 42,359 | 4 | 9.4 |
| Clarke | 27,993 | 3 | 10.7 |
| Escambia | 36,541 | 3 | 8.2 |
| Russell | 51,436 | 3 | 5.8 |
| Barbour | 26,469 | 2 | 7.6 |
| Bibb | 17,942 | 2 | 11.1 |
| Elmore | 57,071 | 2 | 3.5 |
| Marengo | 23,662 | 2 | 8.5 |
| Autauga | 39,381 | 1 | 2.5 |
| Chambers | 37,262 | 1 | 2.7 |
| Conecuh | 14,022 | 1 | 7.1 |
| Geneva | 24,727 | 1 | 4.0 |
| Henry | 15,752 | 1 | 6.3 |
| Perry | 12,708 | 1 | 7.9 |
| Washington | 17,385 | 1 | 5.8 |
| Other Counties | 270,940 | 0 | 0.0 |
| South Total n=38 | | 200 | |

TABLE 33

Alabama Hospital Staffing Trends, 1978-1995

Physical Therapist Assistants

| Year | Full-time | Part-time | Vacancies | FTE | Vacancy Rate % |
|---|---|---|---|---|---|
| 1978 | 294 | 64 | 20 | 346.0 | 5.8% |
| 1979 | 316 | 64 | 20 | 368.0 | 5.4% |
| 1980 | 385 | 70 | 29 | 449.0 | 6.5% |
| 1981 | 354 | 86 | 22 | 419.0 | 5.3% |
| 1982 | 370 | 83 | 15 | 426.5 | 3.5% |
| 1983 | 321 | 81 | 8 | 369.5 | 2.2% |
| 1984 | 316 | 70 | 4 | 355.0 | 1.1% |
| 1985 | 323 | 61 | 7 | 360.5 | 1.9% |
| 1986 | 307 | 71 | 13 | 355.5 | 3.7% |
| 1987 | 287 | 85 | 13 | 342.5 | 3.8% |
| 1988 | 288 | 173 | 19 | 393.5 | 4.8% |
| 1989 | 295 | 82 | 23 | 359.0 | 6.4% |
| 1990 | 321 | 99 | 22 | 392.5 | 5.6% |
| 1991 | 331 | 107 | 17 | 401.5 | 4.2% |
| 1992 | 331 | 129 | 22 | 417.5 | 5.3% |
| 1993 | 358 | 133 | 18 | 442.5 | 4.1% |
| 1994 | 352 | 111 | 19 | 426.5 | 4.5% |
| 1995 | 325 | 110 | 25 | 405.0 | 6.2% |

Source:

State Health Planning and Development Agency, 1994, H-11.

State Health Planning and Development Agency, 1995, H-2.

## TABLE 34
## Alabama Nursing Home Staffing Trends, 1989-1995
## Physical Therapist Assistants

| Year | Full-time | Part-time | Vacancies | FTE | Vacancy Rate % |
|---|---|---|---|---|---|
| 1989 | 70 | 15 | 3 | 80.5 | 3.7% |
| 1990 | 74 | 12 | 0 | 80.0 | 0.0% |
| 1991 | 91 | 25 | 2 | 105.5 | 1.9% |
| 1992 | 113 | 0 | 0 | 113.0 | 0.0% |
| 1993 | 124 | 28 | 1 | 139.0 | 0.7% |
| 1994 | 145 | 22 | 1 | 157.0 | 0.6% |
| 1995 | 150 | 25 | 7 | 169.5 | 4.1% |

Source: State Health Planning and Development Agency, 1995, NH-7.

Note: data include PT aides

## TABLE 35
## Alabama Home Health Agency Staffing Trends, 1989-1995
## Physical Therapist Assistants

| Year | Employment Category | Full-time | Part-time | Total |
|---|---|---|---|---|
| 1989 | Payroll Employees | 1 | 0 | 1 |
| | Contractual Employees | 2 | 68 | 70 |
| | Total | 3 | 68 | 71 |
| 1990 | Payroll Employees | 3 | 0 | 3 |
| | Contractual Employees | 14 | 101 | 115 |
| | Total | 17 | 101 | 118 |
| 1991 | Payroll Employees | 5 | 9 | 14 |
| | Contractual Employees | 5 | 94 | 99 |
| | Total | 10 | 103 | 113 |
| 1992 | Payroll Employees | 9 | 10 | 19 |
| | Contractual Employees | 8 | 106 | 114 |
| | Total | 17 | 116 | 133 |
| 1993 | Payroll Employees | 20 | 19 | 39 |
| | Contractual Employees | -* | 121 | -* |
| | Total | -* | 140 | -* |
| 1994 | Payroll Employees | 25 | 15 | 40 |
| | Contractual Employees | 55 | 130 | 185 |
| | Total | 80 | 145 | 225 |
| 1995 | Payroll Employees | 23 | 13 | 36 |
| | Contractual Employees | 81 | 167 | 248 |
| | Total | 104 | 180 | 284 |

Source: State Health Planning and Development Agency (SHPDA). Alabama Home Health Agencies: Full Time, Part Time Staffing (HH-8), 1989-1995 Data Reports.

*Data in SHPDA report incomplete.

# CONCLUSIONS AND IMPLICATIONS

This study examined the supply of and demand for allied health professionals in five fields: occupational therapy assisting, respiratory therapy, physical therapist assisting, radiography, and medical laboratory technology. For more than a decade, study in these fields and other health areas was available through the University of Alabama at Birmingham health professions linkage program and a limited number of free-standing programs. Through the linkage program, students enrolled in community colleges or other institutions for the general education component of an associate degree and studied the professional component at UAB. Following the discontinuance of the linkage program in 1994, a large number of proposals for allied health programs came to the Alabama Commission on Higher Education; some programs were approved, and other proposals fell under a moratorium established by the Commission.

In 1996, the Commission launched a study to examine the need for additional health professions programs in Alabama at the associate degree level. The purpose of this study was to provide the Commission with information for decision-making in the broad spectrum of program development, implementation, and evaluation. Specifically, this study assessed the need for additional programs or expanded programs in allied health at the two-year college level. The findings and conclusions are below.

## FINDINGS AND CONCLUSIONS

- **Radiography, Respiratory Therapy, and Medical Laboratory Technology**

  Supply and demand are in reasonable balance in the fields of Radiography, Respiratory Therapy, and Medical Laboratory Technology. There does not appear to be sufficient demand to justify the expansion of existing programs or the creation of new programs in these areas. Supply and demand are projected to be in balance for the foreseeable future.

- **Occupational Therapy Assisting**

  The current supply does not meet demand in South Alabama and the regional imbalance is pronounced in occupational therapy assisting. The creation of a program in South Alabama, either freestanding or in partnership through distance education, will increase educational access and will better satisfy regional demand.

- **Physical Therapist Assisting**

  A small undersupply exists in physical therapist assisting, and this imbalance in supply and demand is most prevalent in South Alabama. Currently, four programs serve the state, two each in North and South Alabama. The impending overall increase in graduates will bring supply and demand into balance in the near future. The existing programs can meet statewide demand.

## Implications and Issues for Future Consideration

In the course of this study, a number of issues related to the implementation and evaluation of current programs emerged. The issues of concern center around program quality, clinical sites, program size, and program review. While no attempt was made to solve these issues in this study, it was widely held by survey respondents and those interviewed that these issues affect current and proposed programs and the implications of these issues should be brought to the attention of policy makers and institutional representatives for further consideration.

The findings and conclusions of this study, as listed above, fundamentally call for limiting programs to the current number with the exception of occupational therapy assisting. While these findings might be in conflict with institutional goals in some places, these findings support a regional distribution of programs providing reasonable educational access to a large proportion of Alabama's population. Because of the high cost of health professions education, it is not prudent to establish programs solely to enhance educational access; rather, it is advisable to support existing programs at a level of quality that ensures effectiveness for students and the public at large.

In the absence of further expansion of new programs across Alabama, it is appropriate to turn to issues surrounding the implementation and evaluation of current programs. And, within a stable environment of program offerings, academic leaders and program directors should view this as an opportunity to collaborate to serve the state and each region more effectively.

## Regional Areas of Service

Because health professions programs are limited in number, it is incumbent on existing programs to collaborate to serve the state and each region effectively. In a regional approach to program planning and delivery, programs would focus on regional supply and demand, student access, and workforce needs in the target area. The regions in combination should cover the state.

It is widely recognized that one productive program may adequately serve a state if the primary measure is the number of graduates added to the supply. For example, the UAB linkage program offered quality programs in allied health and, thereby, was effective in increasing the supply in a wide range of allied health fields; nevertheless, the program was not easily accessed by students at a distance and the workforce supply tended to concentrate in Birmingham or nearby. A regional distribution of programs should seek to overcome the problems of distance and distribution while maintaining quality.

It was widely recommended by those interviewed and surveyed that existing programs examine the regions they serve and the enrollment capacity and graduation productivity needed to serve that region. In examining regional needs, programs can address more directly difficult areas and specific opportunities within their region, developing in collaboration with other programs responses to statewide needs and concerns. It was suggested that programs should have a general understanding of the region and the target area for recruitment, clinical sites, and placement, while recognizing that not all students will come from a program's target area nor return to the target area for employment. In a regional approach to program delivery, however, difficult geographic areas and student populations will not be overlooked while easily accessed student populations, clinical sites, and employment opportunities are sources of competition.

Under the premise that community college programs first serve regional needs, a regional approach to issues surrounding program productivity and implementation should assume highest priority. As currently configured, community colleges in Alabama serve regional areas as defined counties. Because of the limits on the expansion of programs in the health fields, these regional boundaries need to be explored by the two-year college sector.

## Program Size and Clinical Sites

A related concern expressed by many people throughout the study was the issue of program size and competition for clinical sites. Typically, students attending community colleges are nonresident, and they commute from the local region. Subsequently, they expect to find employment in their region upon graduation. Thus, programs that accept and graduate too many applicants tend to oversupply a region rather quickly. It is viewed as counterproductive for programs to overproduce for a region, thus creating a cycle of high enrollments followed by low enrollments as student demand reacts to the employment opportunities. Oversupply also tends to weaken the applicant pool as the best qualified applicants turn to fields with higher demand for graduates.

Program size is also related to the need for clinical sites. As programs increase in size, the necessity for clinical spots grows. Not only did program directors express concern about finding adequate clinical sites, but many of those interviewed spoke about the pressure to make clinical spots available and the increasing difficulty of participating in clinical education in combination with the dramatic changes in health care. It was noted that clinical sites are not unlimited and without some limit on the number of students that clinical sites would ultimately cease to be available for all.

The program directors were acutely aware of this problem. It was noted by many in the study, that associate degree programs are not only in competition with other programs for clinical spots, but that health programs in high schools through graduate education are going to the same institutions, agencies, and emerging settings to secure clinical rotations. Several suggested that clinical slots, their usage, and criteria for evaluation should be addressed. The Alabama Department of Postsecondary Education could be instrumental in providing a vehicle for this discussion to take place at the associate degree level.

## Program Quality and Program Review

Quality was a recurring theme throughout the surveys and interviews. There was a concern that institutional goals were driving high enrollments and graduation numbers and that the attention to "inputs" had come at the expense of "outputs," i.e., quality in graduates. The issue of quality in general was raised frequently enough to be taken as a serious concern. It should be noted that no one was more concerned about program quality and student outcomes

than program directors, and there seemed a willingness on their part to discuss this issue, the indicators that signify quality, and the resource and opportunities needed to be effective.

This study did not seek to assess the quality of existing programs, but does concur that current programs could benefit from a process to define and review outcomes on a regular basis. Although accreditation establishes minimum standards of performance, this process often does not address other issues that are important to sponsoring agencies, institutions, and the public they serve. Thus, the quality of programs could be improved through establishing a program review process that would supplement accreditation and would include program indicators of particular interest to the programs and the population they serve. Several respondents went so far as to suggest performance indicators, such as placement of graduates, the number of students taking and passing certification examinations, employer satisfaction, and so forth.

Most importantly, there was widespread support for a discussion of program quality and performance indicators. And, it was felt that now was the time to build a process to assess and enhance quality and to ensure the resources to support quality in the existing programs.

### Program Collaboration and Communication

Another area of concern was improving the communication among providers, educators, and administrative committees and boards. Program directors and other health professionals wanted to have input into decisions concerning program quality and program review, and it was suggested that program directors should convene, by discipline, on an annual or semiannual basis to discuss these and other issues relevant to all programs (e.g., accreditation, curricular content, articulation).

Another area suggested for discussion was distance education. At the time of this study, the national professional accreditation agencies for these fields had not established separate criteria for distance education. Thus, the window of opportunity for distance education in these fields may be now. Two-year institutions have worked in this area in the past and with support could show leadership in this area currently to reach distant locations and historically under served populations.

Most importantly, the current programs must collaborate and be given an opportunity to collaborate over issues of supply and demand and current challenges to programs. The Alabama Commission on Higher Education in cooperation with the Alabama Department of Postsecondary Education should provide the vehicle for this communication.

## REFERENCES


Alabama Department of Industrial Relations, Research and Statistics Division. (June 1996). *Occupational Trends for 2005, Employment by Occupation 1994-2005.*

Alabama State Board of Occupational Therapy. Licensure Data. (1996). Ann Crosby, Executive Director.

Alabama State Board of Physical Therapy. Licensure Data. (1996). Kathryn Brown, Executive Director.

American Association for Respiratory Care. (1996). *What is an RCP?* [On-line]. Available at: http://www.aarc.org/whatarcp.htm.

American Association for Respiratory Care. (July, 1996). Sherry Milligan, Personal communication.

American Medical Association. (1993). *Allied Health Education Directory, 1993* (20th ed.). Milwaukee: American Medical Association.

American Occupational Therapy Association. (January, 1995). *Occupational Therapy Personnel.*

American Occupational Therapy Association. (1995). *1995 Education Data Survey Final Report.*

American Occupational Therapy Association. (February, 1996). *Health Care and Market Reform: Workforce Implications for Occupational Therapy.* Washington, D.C.: Health Policy Alternatives.

American Occupational Therapy Association. (1996). *OATA Web site* [On-line]. Available at: http://www.mother.com/~ktherapy/ot/welcome.html.

American Physical Therapy Association. (1993). *APTA State Licensure Reference Guide.*

American Physical Therapy Association. (1994). *Decade: A Historic Perspective of Physical Therapy Education.*

American Physical Therapy Association. (1996). *APTA Web site.* [On-line]. Available at: http://www.apta.org.

American Physical Therapy Association. (February 1997). "Government Sees Growing Demand for Physical Therapy Through 2005." *PT Bulletin, 12,* (8), p.1, 11.

American Registry of Radiologic Technologists. (April, 1996). *Annual Report to Registered Technologists.* p. 31.

American Registry of Radiologic Technologists. (July, 1996). Mark Raymond, Personal communication.

American Society of Clinical Pathologists. (1996). *ASCP Web site* [On-line]. Available at: http://www.ascp.org.

American Society of Clinical Pathologists, Board of Registry. (November, 1996). Juanita Crannel, Personal communication.

Castleberry, Barbara M., Terri Yablonsky and Laurie Wargelin. (February, 1995). "1994 Wage and Vacancy Survey of Medical Laboratories: Modest Salary Increases Respond to High Vacancy Rates," *Laboratory Medicine, 26, (2),* pp.106-112.

Castleberry, Barbara M., Joel M. Shilling and Thomas R. O'Neill. (August 1996). "1995 Survey of Medical Laboratory Science Programs," *Laboratory Medicine, 27, (8),* pp.518-521.

Commission on Accreditation of Allied Health Educational Programs. (1994). *Accredited Educational Programs in Health Information (Medical Records) Technology*. Chicago: American Health Information Management Association.

Goldstein, Marc and Lisa L. Culver. (1996). Human Resources Estimates for Physical Therapists in the United States through 1996. *American Physical Therapy Association* [On-line]. Available at: http://www.apta.org/research/hum_res.html.

Gwyer, Jan. (January, 1995). "Personnel Resources in Physical Therapy: An Analysis of Supply, Career Patterns, and Methods to Enhance Availability." *Physical Therapy, 75, (1),* pp. 56-65.

Hack, Laurita M. And Thomas R. Konrad. (1995). "Determination of Supply and Requirements in Physical Therapy: Some Considerations and Examples." *Physical Therapy, 75, (1),* pp. 47-53.

HEGIS Degrees and Other Formal Awards Conferred, 1986. Unpublished raw data.

Integrated Postsecondary Education Data System (IPEDS), 1987-1996. Unpublished raw data.

Joint Review Committee on Education in Radiologic Technology. (1996). *JRCERT-Accredited Educational Programs: Radiography*. Chicago: JRCERT.

Morris, L. V. (1992). *Education and the Workforce: Georgia's Health Professions in the 1990s*. Athens, GA: Institute of Higher Education, The University of Georgia.

Morris, Libby V. and Catherine J. Little. (1996). *Georgia's Health Professions: A Decade of Change 1985-1995*. Athens, GA: Institute of Higher Education, The University of Georgia.

National Accrediting Agency for Clinical Laboratory Sciences. (1993). *Inventory of Clinical Laboratory Scientist/Medical Technologist Programs*. Unpublished data.

National Accrediting Agency for Clinical Laboratory Sciences. (February 1997). Olive M. Kimball, Personal communication.

National Board for Respiratory Care. (November 1996). Barbara Rossi, Personal communication.

State Health Planning and Development Agency. (1994). H-11.

State Health Planning and Development Agency. (1995). H-2, NH-7.

State Health Planning and Development Agency. *Alabama Home Health Agencies: Full Time, Part Time Staffing* (HH-8). 1989-1995 Data Reports.

U.S. Department of Labor, Bureau of Labor Statistics. (November, 1995). "Outlook: 1995-2005, Occupational Employment Projections, 1995-2005." *Monthly Labor Review*.

## APPENDIX A
## Advisory Committee

**Representatives of Four-Year Institutions:**

Ms. Betty Canan
Assistant Dean
The University of Alabama at Birmingham
636 Webb Building
Birmingham, AL 35294-3361

Dr. Pat C. Covey
Dean
College of Allied Health Professions
University of South Alabama
UCOM 1500
Mobile, AL 36688-0002

**Representatives of Two-Year Institutions:**

Mr. Bates Gilmore
Chair
Radiography Technology Department
Wallace State Community College - Dothan
Dothan, AL 36303

Ms. Evelyn D. Mettee
Director of Allied Health
Shelton State Community College
1301 15th Street, East
Tuscaloosa, AL 35404

**Representative of the SREB-Pew Consortium:**

Dr. Myra A. Crawford
Research Associate Professor
The University of Alabama at Birmingham
325 Community Health Services Building-20th
930 South 20th Street
Birmingham, AL 35294-2042

Representatives of Healthcare Providers:

Mr. J. Michael Horsley
President
Alabama Hospital Association
PO Box 210759
Montgomery, AL 36121-0759

Ms. Diane Blackwell
Director of Human Resources
Alabama Hospital Association
PO Box 210759
Montgomery, AL 36121-0759

Mrs. Katrina Magdon
Director of Research and Development
Alabama Nursing Home Association
4156 Carmichael Road
Montgomery, AL 36106

State Agency Representatives:

Mr. Larry Menefee
Staff Director of the Health Care Reform Task Force
Alabama Department of Public Health
2033 LeBron Avenue
Montgomery, AL 36106

Mr. J. Elberts Peters
Executive Director
State Health Planning and Development Agency
PO Box 303025
Montgomery, AL 36130-3025

Location:
100 North Union Street, Suite 870
Montgomery, AL 36104

Staff Liaisons:

ACHE:

Ms. Brenda T. Carter
Director of Programs
Alabama Commission on Higher Education
PO Box 302000
Montgomery, AL 36130-2000

Ms. Ellen E. Haulman
Project Coordinator
Assistant Director for Academic Affairs
Alabama Commission on Higher Education
PO Box 30200
Montgomery, AL 36130-2000

Location:
Alabama Commission on Higher Education
RSA Union Building
100 North Union Street
Montgomery, AL 36104

ADPE:

Dr. Bert Slafter
Assistant Director - New Programs
Alabama Department of Postsecondary Education
PO Box 302130
Montgomery, AL 36130-2130

Location:
Alabama Department of Postsecondary Education
The Center of Commerce
401 Adams Avenue
Montgomery, AL 36104-4340

## APPENDIX B
## Interviews and Site Visits

**Katrina G. Magdon**
Director, Research and Development
Alabama Nursing Home Association, Inc.
August 5, 1996

**Diane Blackwell**
Director of Human Resources
Alabama Hospital Association
August 5, 1996

**Dr. Bert Slafter**
Assistant to the Vice-Chancellor for New Programs
Alabama Department of Postsecondary Education
Montgomery
August 6, 1996

**J. Elbert Peters**
Executive Director
State Health Planning and Development Agency
Montgomery
August 7, 1996

**Gary L. Jordan**
Director of Planning
State Health Planning and Development Agency
August 8, 1996

**Carlin Smith**
Data Coordinator
State Health Planning and Development Agency
August 8, 1996

**Bates Gilmore**
Chair, Radiography Technology Department
G. C. Wallace State Community College - Dothan
August 7, 1996

**Dr. Imogene Mixon**
President (interim)
Alabama Aviation and Technical College
August 7, 1966

**John Dinkins**
Academic Dean (Acting)
G.C. Wallace State Community College - Dothan
August 7, 1996

**Ann Cosby**
Executive Director
Alabama State Board of Occupational Therapy
Montgomery
August 21, 1996

**Evelyn Mettee**
Director of Allied Health
Shelton State Community College
August 23, 1996 (Telephone interview)
September 10, 1996

**Linda L. Davis**, MSN, RN
Academic Director, Nursing and Allied Health
Gadsden State Community College
September 9, 1996

**Dr. Myra Crawford**
Research Associate Professor
University of Alabama at Birmingham
September 9, 1996

**Betty Canan**
Assistant Dean
University of Alabama at Birmingham
September 10, 1996

**Dr. Randal H. Robertson**
Director, Respiratory Therapy Program
School of Health Professions
University of Alabama at Birmingham
September 10, 1996

**Carroline Amari**
Chair, Occupational Therapy Program
School of Health Professions
University of Alabama at Birmingham
September 10, 1996

**Dr. Joe Morris**
Dean of Instruction
Jefferson State Community College
September 10, 1996

**Dr. Ted Spring**
Vice-President
Shelton State Community College
September 10, 1996

**Britt Turner**
Chair, Business and Industry Section
Shelton State Community College
September 10, 1996

**Susie Hyde**
Professional Recruitment and Employment
DCH Regional Medical Center
Tuscaloosa
September 10, 1996
October 29, 1996 (telephone interview)

**Kay Troxler**
Vice President
DCH Regional Medical Center
Tuscaloosa
September 10, 1996

**LaDonna Allen**
Academic Programs
G. C. Wallace State Community College, Hanceville
September 11, 1996

**Melinda Campbell**
Health Programs and Clinical Coordination
G. C. Wallace State Community College -Hanceville
September 11, 1996

**Toni Hall**
ALA-CARE Home Health Agency
October 9, 1996 (Phone conversation)

**Brenda Furlow**
Alabama Dept. Of Public Health
Head, Division of Licensure and Certification,
October 16, 1996 (phone conversation)

**Dr. Pat Covey**
Dean, College of Allied Health Professions
University of South Alabama
October 25, 1996

**Barbara Bradford**
Chair, Physical Therapist Assisting Program
Bishop State Community College
October 25, 1996

**Ginelle Williams**
Assistant Chair
Physical Therapist Assisting Program
Bishop State Community College
October 25, 1996

**Georgenne Novak**
Professional Recruiter
DCH Regional Medical Center
Tuscaloosa
October 29, 1996 (telephone interview)

**Debra Thurmond**
Professional Recruiter
Nova Care, Alabama
November 14, 1996

**Dr. Janice Ingle**
Dean, Health Programs
Southern Union Community College, Opelika Campus
November 18, 1996

**Martha Lovelin**
Chief Clinical Officer
AlaCare Home Health Agency
November 20, 1996

**Christie Chandler**
Central Alabama Home Health Care Agency
Human Resources Coordinator
November 26, 1996

**Bill Ely**
Director
Alabama Home Health Care Association
November 26, 1996

**Robert Walker**
Restore Therapy
November 26, 1996

Pam Faust
Director, Seton Home Health Care Services
November 26, 1996

Mary Rose Gray
Operations Manager
Seton Home Health Services
December 2, 1996

Margaret Hamm
Recruiter, Sunbelt Therapy
December 2, 1996

Barry Sowell
Home Care Services of Dothan
Houston County
December 2, 1996

Deborah Jarrett
Alabama Department of Public Health
Home Health Care
Staff Assistant to the Director

Pam Garner
Past President
Alabama Society of Clinical Laboratory Sciences
VA Medical Center, Birmingham

ACHE Staff Members

Dr. William O. Blow
Deputy Executive Director for Planning and Coordination
Alabama Commission on Higher Education

Brenda T. Carter
Director of Programs
Alabama Commission on Higher Education

Ellen E. Haulman
Assistant Director for Academic Affairs
Project Coordinator
Alabama Commission on Higher Education

## APPENDIX C
## Alabama Population
## 1990-1995

| County | 1990 | 1995 | % Change 1990-1995 | County | 1990 | 1995 | % Change 1990-1995 |
|---|---|---|---|---|---|---|---|
| Autauga | 34,222 | 39,381 | 15.08% | Jackson | 47,796 | 50,128 | 4.88% |
| Baldwin | 98,280 | 120,198 | 22.30% | Jefferson | 651,525 | 657,827 | 0.97% |
| Barbour | 25,417 | 26,469 | 4.14% | Lamar | 15,715 | 15,754 | 0.25% |
| Bibb | 16,576 | 17,942 | 8.24% | Lauderdale | 79,661 | 83,598 | 4.94% |
| Blount | 39,248 | 42,721 | 8.85% | Lawrence | 31,513 | 32,803 | 4.09% |
| Bullock | 11,042 | 11,149 | 0.97% | Lee | 87,146 | 94,029 | 7.90% |
| Butler | 21,892 | 21,798 | -0.43% | Limestone | 54,135 | 59,344 | 9.62% |
| Calhoun | 116,034 | 117,263 | 1.06% | Lowndes | 12,658 | 12,946 | 2.28% |
| Chambers | 36,876 | 37,262 | 1.05% | Macon | 24,928 | 23,959 | -3.89% |
| Cherokee | 19,543 | 21,038 | 7.65% | Madison | 238,912 | 258,340 | 8.13% |
| Chilton | 32,458 | 34,912 | 7.56% | Marengo | 23,084 | 23,662 | 2.50% |
| Choctaw | 16,018 | 16,079 | 0.38% | Marion | 29,830 | 30,382 | 1.85% |
| Clarke | 27,240 | 27,993 | 2.76% | Marshall | 70,832 | 78,195 | 10.40% |
| Clay | 13,252 | 13,551 | 2.26% | Mobile | 378,643 | 397,413 | 4.96% |
| Cleburne | 12,730 | 13,272 | 4.26% | Monroe | 23,968 | 24,550 | 2.43% |
| Coffee | 40,240 | 42,359 | 5.27% | Montgomery | 209,085 | 218,880 | 4.68% |
| Colbert | 51,666 | 52,586 | 1.78% | Morgan | 100,043 | 107,034 | 6.99% |
| Conecuh | 14,054 | 14,022 | -0.23% | Perry | 12,759 | 12,708 | -0.40% |
| Coosa | 11,063 | 11,680 | 5.58% | Pickens | 20,699 | 20,956 | 1.24% |
| Covington | 36,478 | 37,459 | 2.69% | Pike | 27,595 | 28,848 | 4.54% |
| Crenshaw | 13,635 | 13,624 | -0.08% | Randolph | 19,881 | 20,323 | 2.22% |
| Cullman | 67,613 | 72,489 | 7.21% | Russell | 46,860 | 51,436 | 9.77% |
| Dale | 49,633 | 50,001 | 0.74% | St. Clair | 50,009 | 57,713 | 15.41% |
| Dallas | 48,130 | 48,022 | -0.22% | Shelby | 99,358 | 123,500 | 24.30% |
| DeKalb | 54,651 | 57,271 | 4.79% | Sumter | 16,174 | 16,390 | 1.34% |
| Elmore | 49,210 | 57,071 | 15.97% | Talladega | 74,107 | 76,737 | 3.55% |
| Escambia | 35,518 | 36,541 | 2.88% | Tallapoosa | 38,826 | 39,737 | 2.35% |
| Etowah | 99,840 | 100,259 | 0.42% | Tuscaloosa | 150,522 | 158,732 | 5.45% |
| Fayette | 17,962 | 18,019 | 0.32% | Walker | 67,670 | 69,678 | 2.97% |
| Franklin | 27,814 | 29,313 | 5.39% | Washington | 16,694 | 17,385 | 4.14% |
| Geneva | 23,647 | 24,727 | 4.57% | Wilcox | 13,568 | 13,628 | 0.44% |
| Greene | 10,153 | 10,076 | -0.76% | Winston | 22,053 | 23,489 | 6.51% |
| Hale | 15,498 | 16,212 | 4.61% | | | | |
| Henry | 15,374 | 15,752 | 2.46% | Total | 4,040,587 | 4,252,982 | 5.26% |
| Houston | 81,331 | 84,367 | 3.73% | | | | |

Source: 1990 PL-94-171 tape, U.S. Bureau of the Census.
U.S. Bureau of the Census, Estimates Division, March, 1996

Projected Population, 2000: 4,451,000 4.66%

APPENDIX D

North and South Alabama Population

1990-1995

| North | 1990 | 1995 | % Change 1990-1995 |
|---|---|---|---|
| Blount | 39,248 | 42,721 | 8.85% |
| Calhoun | 116,034 | 117,263 | 1.06% |
| Cherokee | 19,543 | 21,038 | 7.65% |
| Clay | 13,252 | 13,551 | 2.26% |
| Cleburne | 12,730 | 13,272 | 4.26% |
| Colbert | 51,666 | 52,586 | 1.78% |
| Cullman | 67,613 | 72,489 | 7.21% |
| DeKalb | 54,651 | 57,271 | 4.79% |
| Etowah | 99,840 | 100,259 | 0.42% |
| Fayette | 17,962 | 18,019 | 0.32% |
| Franklin | 27,814 | 29,313 | 5.39% |
| Jackson | 47,796 | 50,128 | 4.88% |
| Jefferson | 651,525 | 657,827 | 0.97% |
| Lamar | 15,715 | 15,754 | 0.25% |
| Lauderdale | 79,661 | 83,598 | 4.94% |
| Lawrence | 31,513 | 32,803 | 4.09% |
| Limestone | 54,135 | 59,344 | 9.62% |
| Madison | 238,912 | 258,340 | 8.13% |
| Marion | 29,830 | 30,382 | 1.85% |
| Marshall | 70,832 | 78,195 | 10.40% |
| Morgan | 100,043 | 107,034 | 6.99% |
| Pickens | 20,699 | 20,956 | 1.24% |
| Randolph | 19,881 | 20,323 | 2.22% |
| Shelby | 99,358 | 123,500 | 24.30% |
| St. Clair | 50,009 | 57,713 | 15.41% |
| Talladega | 74,107 | 76,737 | 3.55% |
| Tuscaloosa | 150,522 | 158,732 | 5.45% |
| Walker | 67,670 | 69,678 | 2.97% |
| Winston | 22,053 | 23,489 | 6.51% |
| North Total | 2,344,614 | 2,462,315 | 5.02% |
| Total | 4,040,587 | 4,252,982 | 5.26% |

| South | 1990 | 1995 | % Change 1990-1995 |
|---|---|---|---|
| Autauga | 34,222 | 39,381 | 15.08% |
| Baldwin | 98,280 | 120,198 | 22.30% |
| Barbour | 25,417 | 26,469 | 4.14% |
| Bibb | 16,576 | 17,942 | 8.24% |
| Bullock | 11,042 | 11,149 | 0.97% |
| Butler | 21,892 | 21,798 | -0.43% |
| Chambers | 36,876 | 37,262 | 1.05% |
| Chilton | 32,458 | 34,912 | 7.56% |
| Choctaw | 16,018 | 16,079 | 0.38% |
| Clarke | 27,240 | 27,993 | 2.76% |
| Coffee | 40,240 | 42,359 | 5.27% |
| Conecuh | 14,054 | 14,022 | -0.23% |
| Coosa | 11,063 | 11,680 | 5.58% |
| Covington | 36,478 | 37,459 | 2.69% |
| Crenshaw | 13,635 | 13,624 | -0.08% |
| Dale | 49,633 | 50,001 | 0.74% |
| Dallas | 48,130 | 48,022 | -0.22% |
| Elmore | 49,210 | 57,071 | 15.97% |
| Escambia | 35,518 | 36,541 | 2.88% |
| Geneva | 23,647 | 24,727 | 4.57% |
| Greene | 10,153 | 10,076 | -0.76% |
| Hale | 15,498 | 16,212 | 4.61% |
| Henry | 15,374 | 15,752 | 2.46% |
| Houston | 81,331 | 84,367 | 3.73% |
| Lee | 87,146 | 94,029 | 7.90% |
| Lowndes | 12,658 | 12,946 | 2.28% |
| Macon | 24,928 | 23,959 | -3.89% |
| Marengo | 23,084 | 23,662 | 2.50% |
| Mobile | 378,643 | 397,413 | 4.96% |
| Monroe | 23,968 | 24,550 | 2.43% |
| Montgomery | 209,085 | 218,880 | 4.68% |
| Perry | 12,759 | 12,708 | -0.40% |
| Pike | 27,595 | 28,848 | 4.54% |
| Russell | 46,860 | 51,436 | 9.77% |
| Sumter | 16,174 | 16,390 | 1.34% |
| Tallapoosa | 38,826 | 39,737 | 2.35% |
| Washington | 16,694 | 17,385 | 4.14% |
| Wilcox | 13,568 | 13,628 | 0.44% |
| South Total | 1,695,973 | 1,790,667 | 5.58% |